

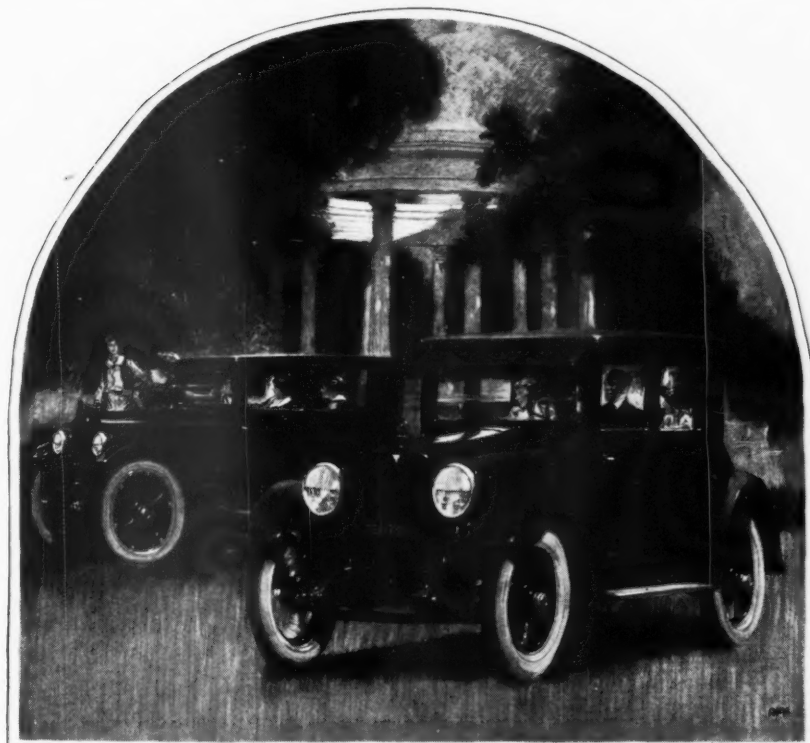
In This Issue—*Engineering for the Service Man*

MOTOR AGE

Vol. XLIV
Number 9

PUBLISHED WEEKLY AT THE MALLERS BUILDING
CHICAGO, AUGUST 30, 1923

Thirty-five Cents a Copy
Three Dollars a Year



Biggest Sales in Our History *Follow New Low Prices*

Hudson and Essex cars, the finest mechanically we ever built, are now priced the lowest for which they ever sold.

They are the most outstanding values in the world. Sales are the largest in our history. Hudson and Essex dealers enjoy success such as few automobile dealers can rival.

Now their opportunity is greater than ever. The Coach, exclusive to Hudson and Essex, gives closed car comforts at open car cost. That means active all year sales—a live business for every month in the year.

Some good territories are open. Write today.

E-39 H-36

Hudson Motor Car Company, Detroit, Michigan

HUDSON-ESSEX

Hudson Prices

Speedster - - - -	\$1375
7-Passenger Phaeton -	1425
Coach - - - - -	1450
Sedan - - - - -	1995

Essex Prices

Touring - - - - -	\$1045
Cabriolet - - - - -	1145
Coach - - - - -	1145

Freight and Tax Extra

\$1000 Cash Contest closes Oct. 1

100 prizes for repairmen

NO-LEAK-O

Piston Rings



Important: In buying piston rings insist on the genuine No-Leak-O with the original "oilSEALing" groove, packed in this standard package bearing the famous ring and seal, our registered trademark. Beware of imitations. Name stamped on every ring.

It Won't Be Long Now—Prize Contest Closes October 1st

WHICH DO YOU WANT?

1st Prize.....	\$250 Cash	4th Prize.....	\$100 Cash
2nd Prize.....	200 Cash	5th-6th-7th-8th.....	50 Each
3rd Prize.....	150 Cash	9th-10th-11th-12th.....	25 Each

and 88 coupon books of 12 coupons each, each coupon good for one 50c No-Leak-O Piston Ring at your jobber's—Worth \$6.00 to you.



We offer you an opportunity to win any one of the valuable prizes listed above. Here's how. We want to know what auto repair men throughout the country think of No-Leak-O Piston Rings as business builders. We will award the above prizes in the order named to the auto repair men writing us the best letters based on their own knowledge of No-Leak-O, and telling in their own way—1: How No-Leak-O Rings build business for repair men who use them. 2: Why No-Leak-O rings do what other rings cannot do, and 3: How No-Leak-O Piston Rings work.

Send the coupon below, and we will send you contest entry blank, and interesting printed matter telling all about No-Leak-O Piston Rings. You are not required to buy anything or assume any obligation of any sort to enter this contest. The prizes will go to the repair men displaying the greatest skill in expressing their honest opinion of No-Leak-O rings.

Send the coupon today, or write us. Contest closes October 1st, 1923.

NO-LEAK-O PISTON RING COMPANY
Muskegon, Michigan

WON'T LEAK
because they're sealed with Oil

No-Leak-O Piston Ring Co. Dept. 176
Muskegon, Mich.

I am an auto repairman and want to compete for one of your prizes. Please write me fully and tell me all about it. Send me an application blank and enter my name right away.

(Please Write Plainly)

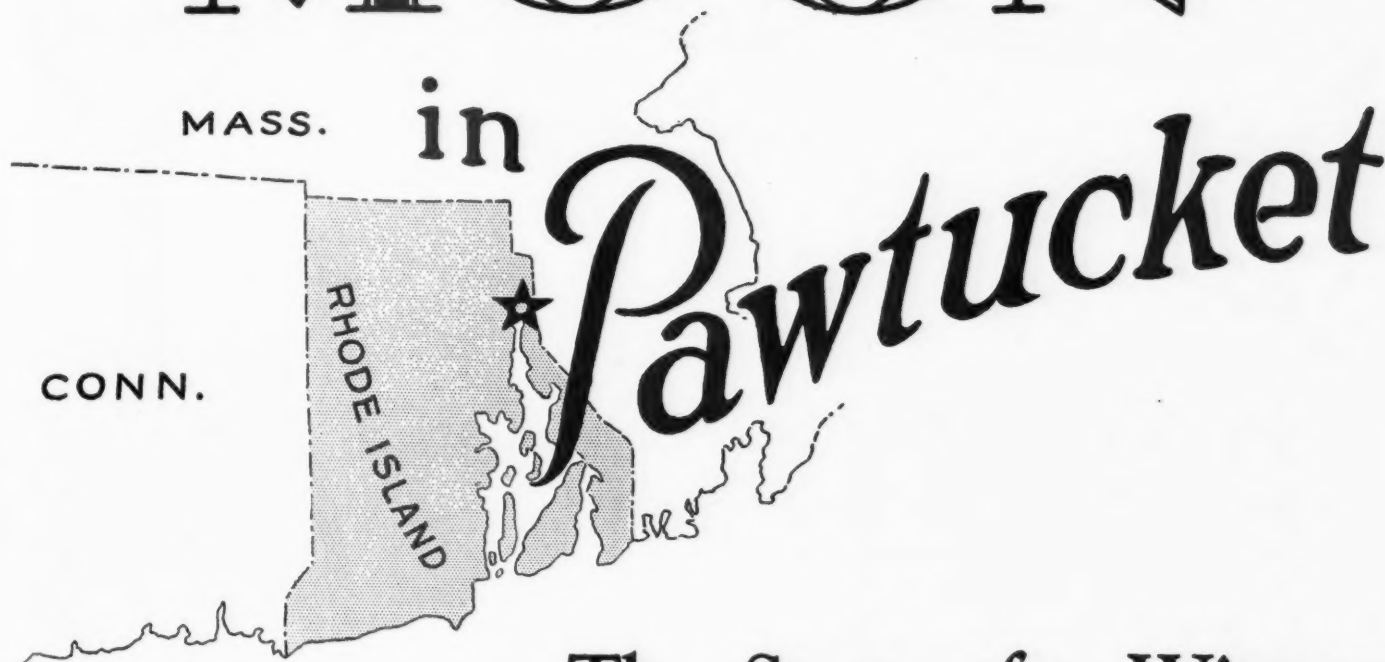
Name.....

Address.....

City.....State.....

Have You Ever Used No-Leak-O Piston Rings?.....

MOON



The Story of a Winner

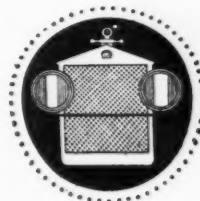
When it comes to selling cars it isn't the size of the city that counts the most. It's the car—with the right man on the job behind it.

Frank Crook has made Pawtucket, R. I., a Moon town. Here he proves it with figures:

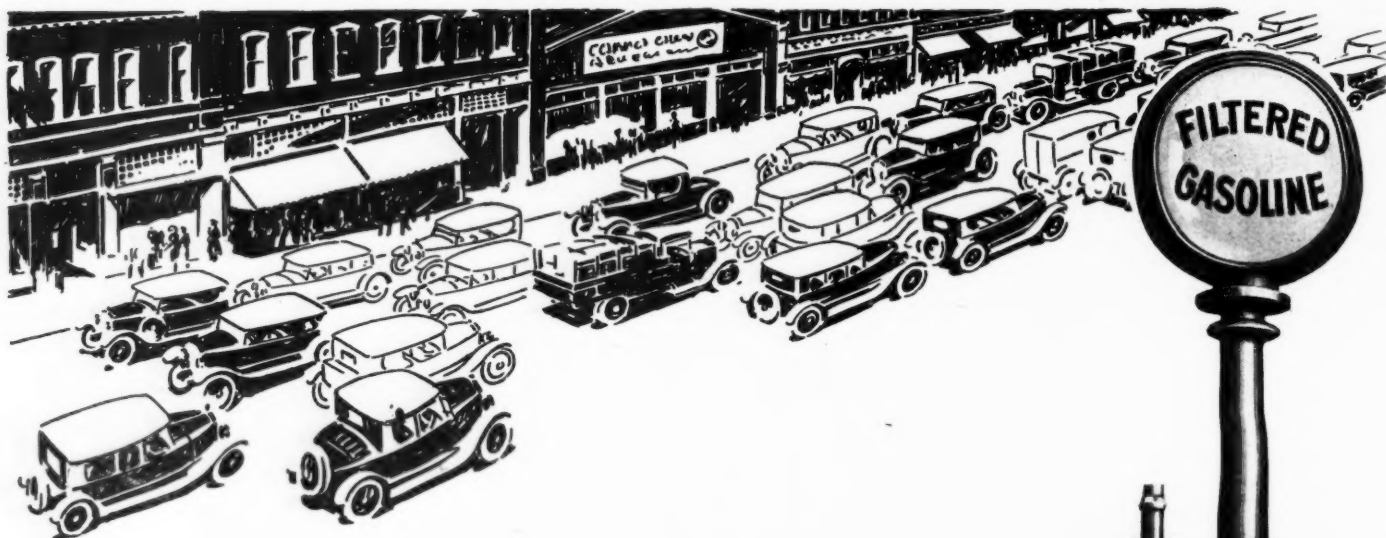
"During the first 5 months of 1923 I sold 118 Moon cars in Pawtucket. In May alone I sold 42—and this is a city of only 54,000. I have set my quota for the year at 275 and feel confident we will easily reach it."

Here's another case of doubling sales—with the Moon.

Are you doubling your sales in 1923?



MOON MOTOR CAR COMPANY, ST. LOUIS, U. S. A.
Stewart McDonald, President



Profits Speeding by Your Door How to Stop Them

The problem is: How to get them to stop at your door?

A Wayne Pump installed at the curb in front of your business place will do the work.

It will pay you in worth while profits from gasoline and oils. It will pay you in the good will it generates. Sales of gasoline are looked upon by motorists as a real service.

A Wayne Pump will pay you even better, however, by reason of the additional sales it brings you. These sales would have gone elsewhere were it not for the silent attraction it exerts.

It is obvious that many motorists who pass your place day after day need new cars. If you could talk with them, you might easily interest them in yours.

Many need tires, accessories of various kinds, batteries or garage service. When they stop in front of your place, a good man at the Wayne Pump can easily gain their interest,—and sell them.

Order a Wayne Pump installed, and note the increased business which follows *if your store is intelligently merchandised through it*. Find out how little it costs to buy. Write us today.

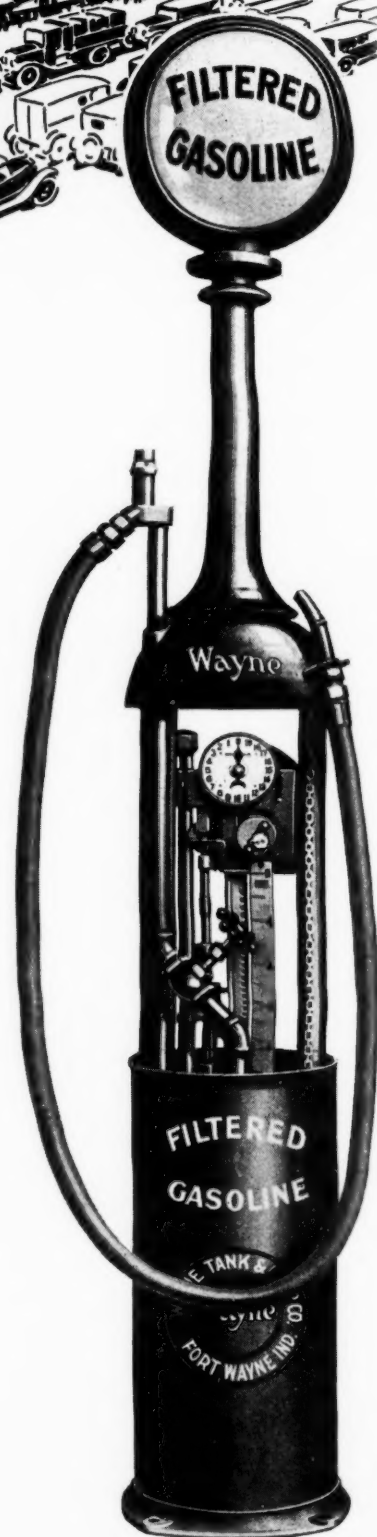
Wayne Gasoline Pumps Are of Various Types and Sizes, and Are Sold at corresponding Prices. There is one that will exactly fit your needs. They Are Made by a Company which for More Than 30 Years Has Been Noted for the Advanced Design and Goodness of Its Products, and which Today Is the Acknowledged Leader in Its Field.

Wayne Tank and Pump Co., 706 Canal Street, Fort Wayne, Ind.

Wayne Tank & Pump Co. of Canada, (Ltd.), Toronto, Ont. Canada
Wayne Tank & Pump Company, 9 Kingsway, London, W. C. 2, England
Division Offices in: Atlanta, Birmingham, Boston, Chicago, Cincinnati, Cleveland, Columbus, Dallas, Dayton, Des Moines, Detroit, Indianapolis, Jacksonville, Kansas City, Milwaukee, Minneapolis, New York, Omaha, Peoria, Philadelphia, Pittsburgh, San Francisco, St. Louis and South Bend

Warehouses in: Philadelphia and San Francisco

An International Organization with Sales and Service Offices Everywhere



REG. U. S. TRADE MARK
Wayne

HONEST MEASURE PUMPS

MOTOR AGE

Reg. U. S. Pat. Off.

Published Every Thursday by

THE CLASS JOURNAL COMPANY

MALLERS BUILDING

59 East Madison Street, CHICAGO

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No. 9

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Single Copies	35 cents

Subscriptions accepted only from the Automotive Trade

Entered as Second Class Matter Sept. 19, 1899, at the Post Office at Chicago, Ill., under Act of March 6, 1879.

A National Quick-Delivery System

A great chain of Goodrich branches, depots and warehouses in every important center gets you the sizes you need in Goodrich Tires and gets them there fast.

What this service means is forcibly shown in a recent letter from a California dealer:

"Since handling Goodrich and having the benefit of the District Warehouses or being able to draw on the local branch for emergency or fill in stock, I have cut my inventory to bed rock and yet am taking care of my trade better than ever."

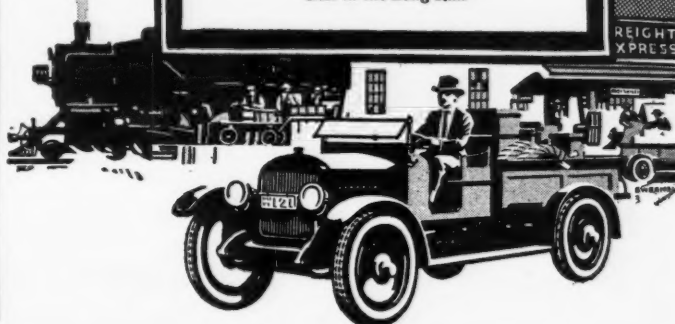
Golden Gate Tire Shop
Medford, California

But don't overlook this point. The best merchandising and delivery systems in the world won't give you other than temporary advantages unless they have Dependable Quality back of them. Goodrich dealers not only get business but hold it because of the year in and year out superior service value of Goodrich Tires.

THE B. F. GOODRICH RUBBER CO.
Established 1870

Goodrich TIRES

"Best in the Long Run"



CHASE DREDNAUT Motor Topping

"DEFIES TIME AND THE ELEMENTS"

Consider how Chase Drednaut superiority was reached. For more than a quarter of a century skilled chemists worked to produce a combination of materials for Motor Topping which would look better, work easier, last longer than any other and yet not be out of reach in cost.

The result of their work is shown in Chase Drednaut—made from a secret formula upon which it seems impossible to improve. Your skill and your ambition to produce quality tops require that you use the best material. Look over your stock NOW and fill your needs with Chase Drednaut Motor Topping—not merely a top fabric but truly an achievement—a superior top fabric.

L. C. CHASE & CO., BOSTON

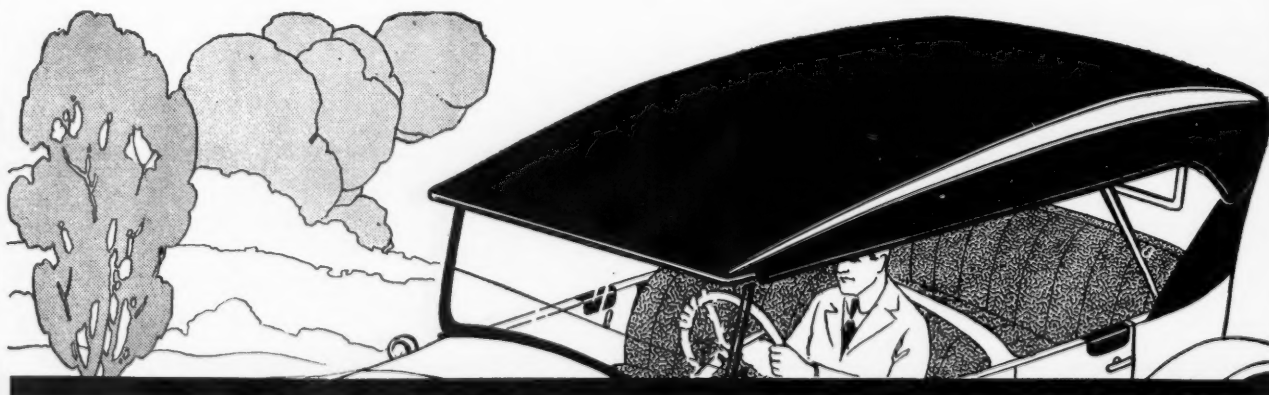
NEW YORK

DETROIT

SAN FRANCISCO

CHICAGO

The name Drednaut, now stamped every twenty-four inches on the surface of the material close to the edge, substantiates our guarantee, assures you proper protection and provides an important selling point.



A Message to Retail Salesmen

Are You In Competition With Yourself?

The Studebaker salesman has a consistent sales argument because Studebaker specializes in Sixes.

He is not subjected to the customary embarrassments which salesmen must suffer who have to switch their customers from one car to another, of more cylinders or fewer cylinders—or to a different name on the radiator.

In other words, the Studebaker retail man does not have to talk against himself or get tangled up in the conflicting sales points of different types of cars.

He sells nothing but Sixes and can talk convincingly on the superiorities of the Six.

It is not difficult to sell the prospect on Studebaker's reputation for quality, value and integrity. This has been in the making for 71 years.

When the buyer is convinced of six-cylinder advantages and of Studebaker superiority, he can be fitted with a car of the size, style and price that will exactly suit him.

And when he comes to buy again, you can fit him again—and again—and repeat business is not only profitable but comes to you with little or no effort.

Studebaker salesmen can make life-time customers and life-time friends out of every transaction.

The Studebaker dealer is always on the lookout for good retail men. Talk it over with him. He may point out to you the road that leads to the success for which you have been striving.

1924 MODELS AND PRICES—f. o. b. factory		
LIGHT-SIX 5-Pass., 112" W. B., 40 H. P.	SPECIAL-SIX 5-Pass., 119" W. B., 50 H. P.	BIG-SIX 7-Pass., 126" W. B., 60 H. P.
Touring.....\$995	Touring.....\$1350	Touring.....\$1750
Roadster (3-Pass.)..... 975	Roadster (2-Pass.).....1325	Speedster (5-Pass.).....1835
Coupe-Roadster (2-Pass.) 1225	Coupe (5-Pass.).....1975	Coupe (5-Pass.).....2550
Sedan.....1550	Sedan.....2050	Sedan.....2750

THE STUDEBAKER CORPORATION OF AMERICA
South Bend, Indiana

Studebaker

T H I S I S A S T U D E B A K E R Y E A R

\$2190

f. o. b. Factory



A New Nash Sales Attraction

The New Six Sedan for Seven

Nash developed this new model so that Nash dealers would be exceptionally well-equipped to work the market for big, all-family, all-year cars.

Though shapely and graceful as a less commodious car it provides an unusual amount of leg and seat space.

All passengers enjoy the utmost freedom when seated and there are two comfortable auxiliary seats that can be folded against the back of the front compartment when not in use.

A big feature of these two auxiliary seats is their construction. They are upholstered heavily, following the design of the front and rear seats.

A generous number of heavy coiled wire springs is used so that the passengers ride restfully.

You'll note that the windshield is tilted with consummate technique toward the

back so the area of driving vision is magnified greatly.

The new-type fenders of a long, rolling, full sweeping type accentuate the smart symmetry of the body lines.

When you come to the fittings and appointments you find that Nash has provided practically every feature of equipment that could possibly interest a prospect.

And, in addition to all the expensive improvements and developments, Nash has further increased the sales value of this new car and reduced competitive resistance by not advancing the price a single dollar.

Bigger business and greater profits than ever are awaiting dealers with this new line of Fours and Sixes to sell.

Get on the right side—the Nash side—of the automobile fence. *Wire*—if you're interested in good territory with the Nash contract.

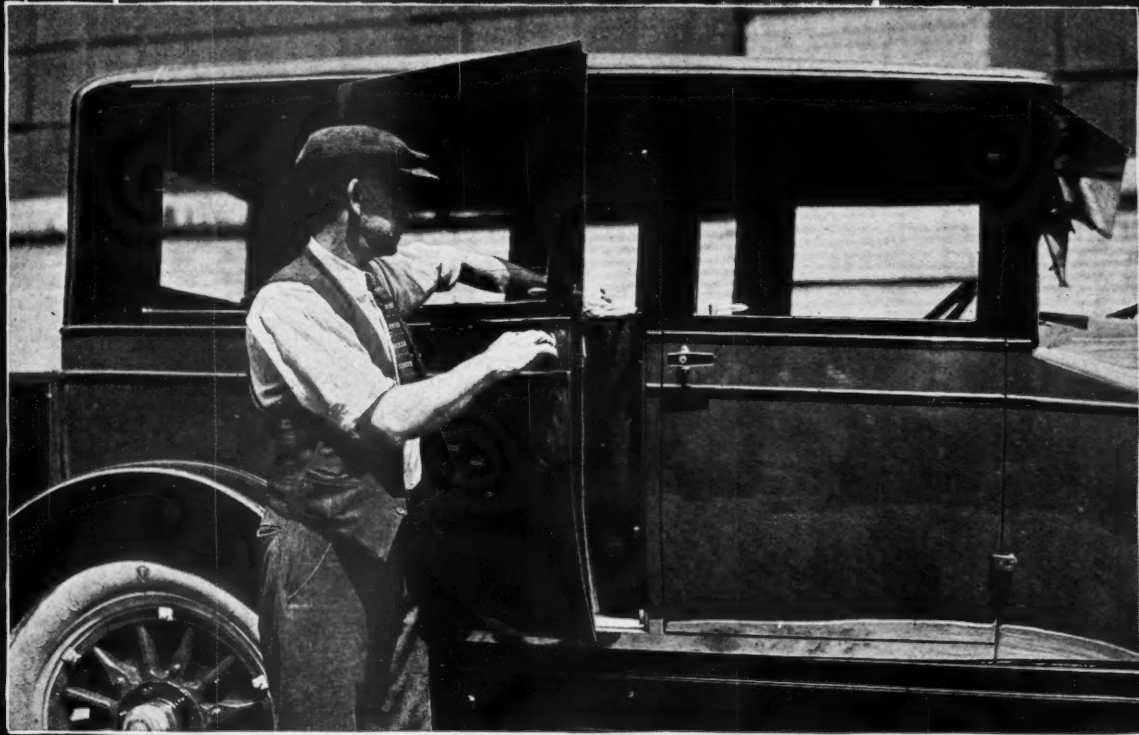
No Advance in Prices on New Line

NASH

The Nash Motors Company, Kenosha, Wisconsin

(1919)

What Any Mechanic Will Tell You About COLE Body Construction



"The body construction of the new Cole Master Model is the best I ever saw. The boss has a new Brouette and he told me to look it over. First I looked under the hood—then at the body.

"It's an extra rigid body, constructed of the hardest wood, fashioned with steel—has tight joints that will not work loose—and extra door lugs to prevent door gaps and rattles. The strong Cole chassis is topped with a body that *is* a body—it has a rigid construction that will not "twist," rattle or creak even after many thousands of miles of driving.

"The finished job makes the Cole unquestionably the best built as well as the most beautiful car that goes along our boulevards.

"The dealer that carries a Cole franchise and sells the Master Model Cole certainly "has the goods" in the Cole car, from front bumper to rear bumper."

COLE MOTOR CAR COMPANY
INDIANAPOLIS, U. S. A.

COLE

There's a Touch of Tomorrow in All Cole Does Today

*Reproduction of an Advertisement
Appearing in The Saturday Evening
Post of August 18, 1923*



The New Merchant

Twenty years ago the principal function of the Petroleum Industry was to supply kerosene for lamps. Its assets did not exceed \$750,000,000.

The kerosene lamp has passed, yet the Petroleum Industry, with \$7,500,000,000 in assets, is today the second largest in the United States. Expending a billion dollars a year for supplies, and millions more for wages, it is a potent influence for prosperity.

When the motor car superseded the oil lamp as chief customer of the Petroleum Industry, it brought into being a new type of merchant. He presides at 30,000 drive-in filling stations and 250,000 curb pumps, where he dispensed most of the 4,844,300,000 gallons of gasoline and 250,000,000 gallons of oil sold to motorists in 1922. Supplying him as well as millions of farmers, are the sturdy tank trucks of 37,000 wholesale distributing stations.

Graham Brothers Trucks are serving in the production, refining and distribution branches of 150 oil companies. Among these are the Associated, Empire, Gulf Refining, Pure Oil, Shell, Sinclair, Standard and Texas. There is no indorsement as complete and emphatic as an additional order—and these companies are ordering additional Graham Brothers Trucks in constantly increasing numbers.

*1 Ton Chassis, \$1265; 1½ Ton, \$1325;
f. o. b. Detroit or Evansville, Ind.*

G R A H A M B R O T H E R S
Detroit — Evansville



GRAHAM BROTHERS TRUCKS

SOLD BY DODGE BROTHERS DEALERS EVERYWHERE

MOTOR AGE



One of the pathetic sights we see so often in this business is that of a woman waiting in the doorway of a "garage" or service station while her male companion is attending to having necessary repairs or adjustments made to the car. There is no place for her to sit down and rest. Even the cobbler in the smallest town shop provides a place for his customers to sit down

Little Things That Make a Business Big

A Big Building and Large Personnel Mean Little If the Atmosphere of the Place Is Cold and Uninviting. Personal Touch of the Small Town Dealer Often Lacking in Larger Institution. The Lowly Shoe Repairer Even Offers His Customers Chairs While They Wait. Many Little Things Possible to Help Tourists, Without Increasing Overhead

By B. M. IKERT

"WE do a lot of little things in our business, which the other fellows in town do not do and I guess that's largely responsible for our success."

Those are almost the exact words coming from a motor car dealer in a town of some five thousand people. He says psychology is the greatest factor in business and while he makes sure that every job, speaking now of the maintenance and service departments of his business, is mechanically right, he also makes sure that the

customer first has been sold properly on having the work done and also that he will be satisfied with the job afterwards.

Right at this point many will jump up and say "We also do this, so there is nothing so wonderful about this dealer's methods." True enough. A lot of men in this business mean and actually do in many cases serve the customer well when it comes to mechanical excellency of a repair job, but they fail in one point, usually.

They fail in the small things which appeal to a customer,

those things which he comes in contact with in most other lines of business. The funny part of it all is that these small things which help so materially in building up a business are things which cost nothing, literally speaking, add very little to the overhead and are as simple as pie.

The other day a woman said "I like to trade at Fisher's, Mr. Fisher is so pleasant to customers." Fisher runs a meat market. Maybe his shop is not the finest in town nor as large as some other, but he makes up for it by throwing in a good measure of friendliness when his patrons buy. And they like it. And so would practically every owner of an automobile like it if he was shown a little of the same friendliness of Fisher.

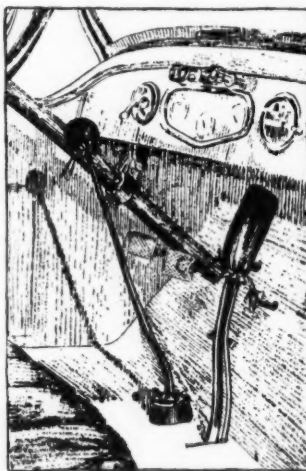
This is not to be taken in a literal sense whereby it is implied that every automobile dealer must meet his customers like a laughing hyena. This spirit of friendliness has many applications.

Take the illustration at the head of this article. The woman stands in the doorway while the car is being worked upon inside the building. There is no place for her to sit down and if there were no one would be likely to invite her to sit down and wait while the work was being done.

What will happen and what happens in ninety per cent of the cases is that friend husband will have to scout around the neighborhood and see where she might find a suitable place to rest. Tourists, especially do not know a town and it's a rotten feeling when you have to spend a lot of time looking for a place to sit down.

The strange part of it is that dealers who have showrooms do not seem to take the hint and put in a couple of chairs, a table and some magazines. But even if these were not present it would seem that the least that could be done is to invite a woman to sit down in the office.

She certainly makes a pathetic looking figure standing in the doorway, while her husband gives the necessary instructions to the mechanic. Even a shoe repairer has a few chairs about his humble shop for his patrons and in some of these places you will find a newspaper or two for the patrons to read while their shoes are being repaired, just some of the little things that help.



Covers for fenders, running boards, doors and seats for protecting customers' cars while they are being worked on are beginning to be more and more common in the better class of service stations, but how completely this can be carried out is shown above. One dealer goes so far as to place small leather bags or pouches over the control levers of his customers' cars

Some of the very large service stations having spacious rest rooms make the mistake of so completely hiding these rest rooms that patrons cannot find them and seldom do you find an attendant in these places who calls the attention of the customers to the rest rooms.

It should be part of the service salesman's job when they know that cars are to be left for a while in the service department, to call attention to these rest rooms and not let the customers start off blindly wandering around the place wondering where to go. Why wait for the customer to ask questions? Beat him to it and tell him.

To illustrate: The other day I was in a service department and a car came in carrying four tourists. The foreman of the service department interviewed the driver and found out his troubles. They talked a few minutes, after which the driver got out. Then the other passengers asked the driver "Will we have to get out?" The foreman heard it and said it would make the job a little easier and then added, "Just step this way please and make yourself at home."

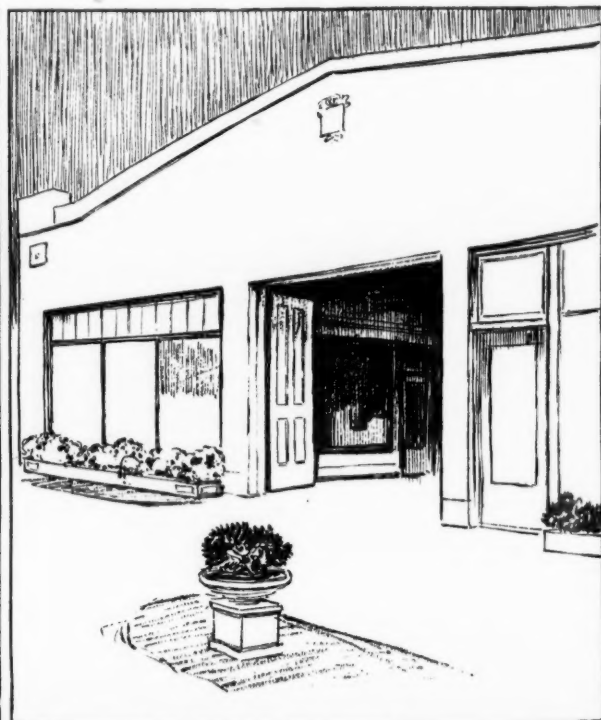
He led them to a door leading to the showroom in one corner of which were six wicker chairs, a table and some magazines. It was pleasant little corner and the party was glad to get a little rest. Close by were the washrooms, plainly marked and all told here was a case of where the customers—your guests—were made perfectly at home.

Not only that, the foreman said "I will call you when the job is ready and have the car out in front for you". He turned the car over to a mechanic and said to the latter "Let me know a few minutes before you are through with the job".

The reader, we believe, readily will agree that this sort of service costs nothing, adds nothing to the overhead and will go a long way toward building up the business.

The small town dealer's place of business gets a lot of night storage, and in this connection there are several little things he can do to build up good will and increase his profits.

One place we recall in particular, makes a practice of filling the radiator of the customer's car, testing the battery, lights and horn and ascertaining the amount of fuel in the gasoline tank. Also, the night mechanic makes a superficial inspection of the car and fills out a card. On this card it states that the



Have you ever thought that the hangers-on in front of your place are a liability? One enterprising dealer in a small town overcame this objection by taking away the loafers' benches and installing flower boxes, thus attracting instead of detracting

radiator has been filled, battery tested and filled with water if necessary, lights are all right, horn operates, etc. Also there is listed the amount of fuel and if the inspection shows a broken brake anchor bracket, for example, this is listed.

Then when the customer calls for the car in the morning the mechanic takes off the card which is attached to the radiator, tells the customer the radiator is filled and of the other things which have been done. Then he adds that the tank is nearly empty and solicits a sale of fuel. Also he calls attention to whatever parts may be broken and in most cases the customer, being impressed by this added touch of service, has the work done.

He is given the card, if he wants it, and what probably happens is that he gets to talking with a fellow tourist and says that by all means if the latter is going to put up for the night at Blankville to stop at the Runwell garage.

Here's another thing that may seem far fetched but which in reality is a serious matter often and largely responsible for a dealer's not making good on his service and maintenance. Have you ever thought that your place of business might be a rendezvous for hangers-on who give your place an atmosphere characteristic of the average pool room?

Why is it that many women drivers in particular say "I don't like to drive to Blank's place, there always seem to be a lot of toughs there"? It is because the "garage" in many a small town, and it is true of the large towns too, is the hangout for an element which has no place in the rendering of good service.

The small town dealer we mentioned at the beginning of this article said he had made it a point long ago not to have any men and boys hanging around his place. Instead of the usual bench alongside the entrance of so many small town garages this dealer had placed boxes of flowers, and thus not only won his point with the hangers on, but incidentally beautified the place. What previously had been distasteful to customers had been made inviting.

"The larger the place the rotter the service" is what one car owner said the other day. He had in mind a certain large service station which, while it was well laid out and equipped, had an atmosphere about it that would rival the polar regions so far as reception of customers is concerned.

This customer, by the way, had formerly lived in a small town and said he was always given a warm reception when he called in the small service station of the dealer who had sold him cars for years. He had moved to the large city and rather had expected to get from this mammoth institution the same glad hand as in the small town. But after a few experiences there he said he wished he were back in the small town, so far as servicing his car was concerned.

The fact of the matter is that this large institution is sadly lacking in those small things which enable the small town business to inject a little personal touch into all it does.

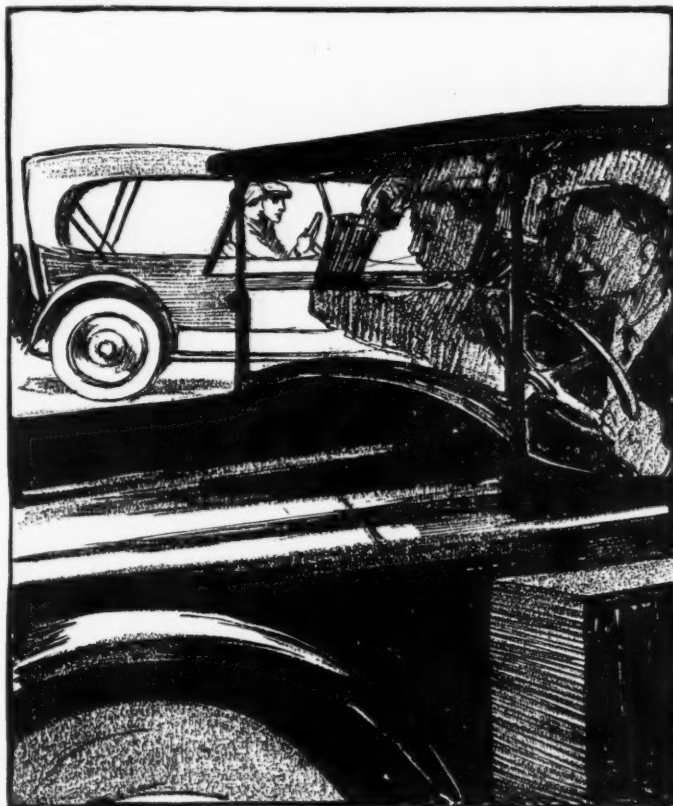
There is a dealer we recall who makes it a point to find out the hobby of his customer so far as possible. If a certain customer's hobby is fishing, then fishing is the topic of conversation during the transaction of business. With others it might be golf, hunting or radio.

Then again, there is on record the case of one concern which always writes the words "Thank You" on the face of the customer's bill when it is paid. The cashier does not use a rubber stamp for this but actually writes it in ink. Just a little thing, true, but the customers are impressed by it.

In one middle western city is a dealer who goes over every customer's car with body polish, when a repair or service job on such a car runs over \$10. It takes a man only a short time to do this and you can imagine the customer's delight when he sees the car all spick and span, whereas he might have brought it in in a dusty and dirty condition.

This same dealer also oils the door hinges and puts beeswax on the doors where they bind, if a road test of the car brings to light squeaks in the doors. He does not tell the customer about this, but the customer soon notices when he drives the car that the squeaks in the doors are no more.

Out of justice to those institutions now doing so, we mention here the practice of protecting the customers' cars while they are being worked upon in the service station. Many institutions do this at present but generally speaking it is one of the things which still has a chance to make considerable headway.



A little thing that made a big hit with a man and his wife was the above instance, when two mechanics after pulling a stalled car out of a ditch tipped their caps as they left and said, "Good luck." Too frequently such men wear a frown on their face after pulling you out that seems to say, "You ought to know better than to go into the ditch"

Covers over fenders, doors and seats allow a mechanic to do his work without danger of soiling the customer's car.

We know of one shop that even goes so far as to cover the gearshift and brake levers with small leather pouches or bags. This lets them manipulate the gears and, when they are through with the car and the bags are slipped off, leave the levers clean for the owner. Small item, sure, but how many fine mechanical jobs on a car are nullified in the minds of a owner when he grasps a smeary gearshift lever?

In speaking of the little things that count, a car owner recently related an incident which he says impressed him and made him feel that these "garage fellows" are pretty decent sort of chaps after all.

This car owner and his wife were out driving and on a rather narrow road and backed into a deep ditch in an attempt to turn around. It was a case of having to be pulled out with a tow car. The man remembered an automobile establishment several miles back and inquiry from a farmer gave him the name of the concern. He called them by telephone and hardly had gotten back to his stranded car when the tow car arrived. Two mechanics were aboard and had the car back on the road in short order. The man paid the charge for the service and was well pleased.

But here's what impressed both him and his wife: When the two mechanics turned to go back to their place of business, both tipped their caps and said "good luck".

TIB AUTOMOBILE ROUTE BOOK

A very complete book of maps is published by the Hudson Company, 244 Plymouth Bldg., Minneapolis, Minn. This is known as the TIB Automobile Route book and sells for \$3.00 per volume. Volume 1, which is the northern edition, gives coast to coast routes. Sections of the book are devoted to the Dakotas, the northwest Pacific coast and national parks; Nebraska, western routes; routes in Iowa, Wisconsin and northern Michigan, while another section gives details of routes in Minnesota. Location of camp sites, descriptions of roads and other information is also contained. Volume 1-A gives the southern routes.

Kissel and Gardner Announce New Models

Speedster and Coupe Complete Kissel 55 Line

A COMPLETE line of new Kissel custom-built models, featuring especially the coupe, the speedster and the tourster, is now on display at the show-rooms of all Kissel distributors and dealers.

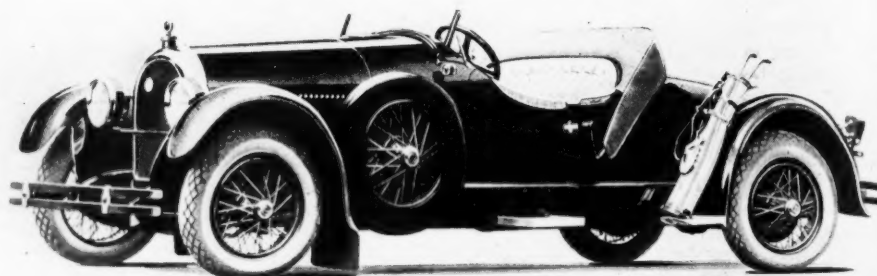
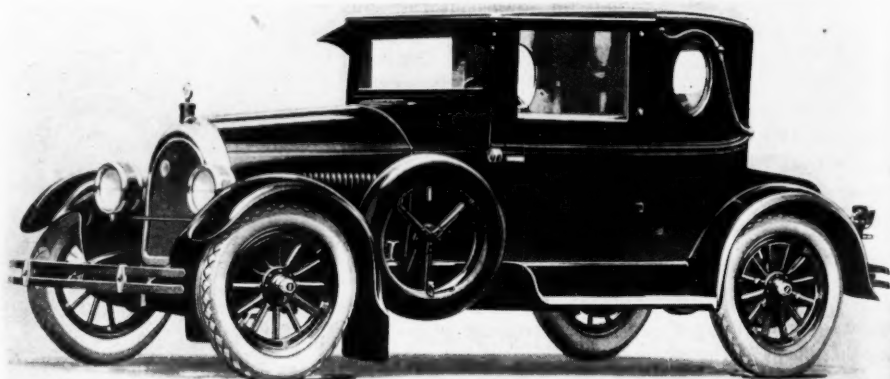
These three cars, with the phaeton and brougham-sedan, will constitute the new Kissel line of model "fifty-fives" for 1924.

All Kissels of the new type are mounted on the standard "fifty-five" chassis.

In general design the coupe follows the lines of the brougham-sedan, having slightly rounded rear corners, oval windows in the rear quarters, and curved window bows that distinguish the brougham. The coupe is a two-door job, and designed to carry four persons.

In general construction and equipment it is similar to the brougham-sedan and carries the three-quarter length coach step. It has the full crown fenders of the other Kissel models, with spare tires mounted at either side of the hood.

These new body models are built in the Kissel factory. The engine has the same features of previous Kissels, including thermostatic control of the cool-



ing system and automatic oil control. The chassis also retains the frame design with a "kick-up" at either end for greater

roadability, and bronze graphited bushings on all moving parts for quietness and long life.

A New Gardner Model 3-Door Brougham

THE Gardner Motor Co., St. Louis, announces the addition of a new model, a 3-door brougham.

In construction the body is closely patterned after Gardner's latest model sedan. It has an all-metal covered body with rounded contours for the cowl, hood and radiator, which harmonize with the body lines otherwise.

The big features of the body are the three doors—two on the right side, which permit of direct entrance to both seats,

and the front seat, which is made solid, not divided or folding, provides ample room for the driver and extra front seat occupant.

The rear door enables those riding in the rear seat to get into and out of the car without disturbing the occupants of the front seat. The back of the front seat is cut out at the bottom, which permits of added leg room, and the rear seat is amply wide to seat three people comfortably.

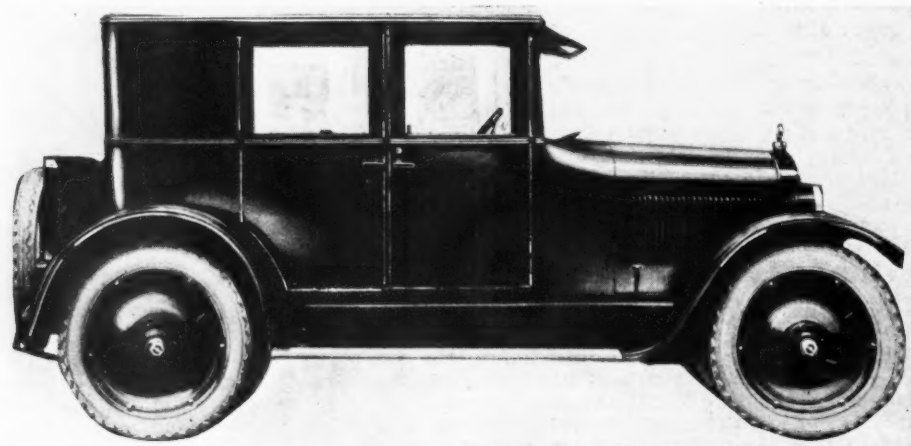
A substantially mounted trunk at the rear of the body is standard equipment.

The upholstery is 21-oz. all-wool blue cloth. The inside body hardware is of Colonial design in silver finish. All three doors have inside locks and the right front door has an outside lock and key. The three door windows operate in felt-lined grooves with rotary type automatic lifts, and lower flush with the lower edge of the door window sill. All windows, including the windshield, are solid plate glass.

The steering wheel has a 17 in. rim of genuine walnut, aluminum spider, and anti-rattle spark and gas throttle levers. The instrument board and all inside window rails are ebony finished.

The outside body finish is in a hand-painted lake color, a deep tone of red, below the belt line, black above. Fenders and running board aprons, hard baked black enamel. Artillery type wood wheels with 32x4 in. cord tires are standard equipment. Tuarc steel wheels are furnished at small extra cost.

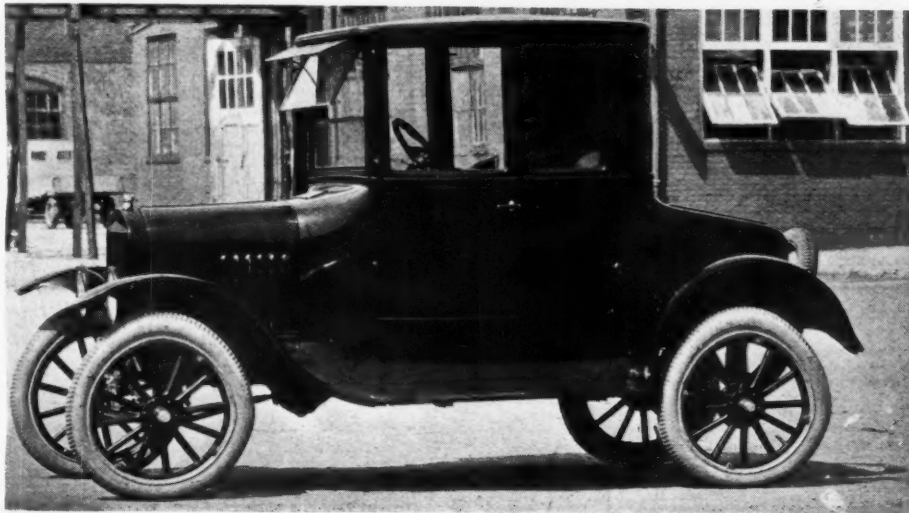
Standard equipment includes nickel-plated motometer and bar radiator cap, metal sun visor, rear vision mirror, windshield wiper, drum type head lamps with nitrogen bulbs, and aluminum trunk rails.



Improved Body Lines and Higher Radiator Principle Changes in New Ford Line

IMPROVEMENT of body lines by the introduction of a higher radiator is the principal change in the new Ford line, production of which was gotten under way this week. The new radiator is an inch and a half higher than the former and has an apron at the bottom which joins a similar apron effect on the fenders. The larger radiator also increases cooling efficiency. There is no radical departure in construction, but a general improvement and more graceful lines.

In bringing out its new models the company has withdrawn its two-door sedan, the passenger line now comprising roadster, touring car, two-passenger coupe and four-door five-passenger sedan. There is no change in price on any models, the four-door sedan continuing at \$725, the price set on its introduction.



Aside from the front end changes the open models remain as before, but the entire appearance has been lowered. The coupe body has been redesigned, resulting more trim exterior appearance, more comfortable seating arrangement and greater luggage carrying capacity. The doors are wider and open forward. They are heavily framed for rigidity and strength. A cowl ventilator and a visor have been added, and divided cushions on the seat make it possible to fill the gasoline tank under the seat without the driver arising. A more sturdy rear fender has also been added.

Interior fittings have been improved, the door windows being equipped with revolving type regulators and door locks are provided. Side windows are equipped with lever type regulators. There is a small recessed shelf at the rear of the seat for parcels and the rear vision window is larger and oblong in shape. Improvements corresponding to those in the coupe have been made in the four-door sedan.

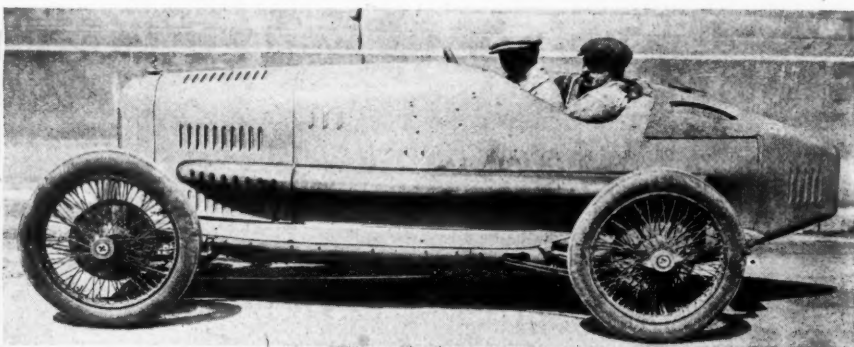
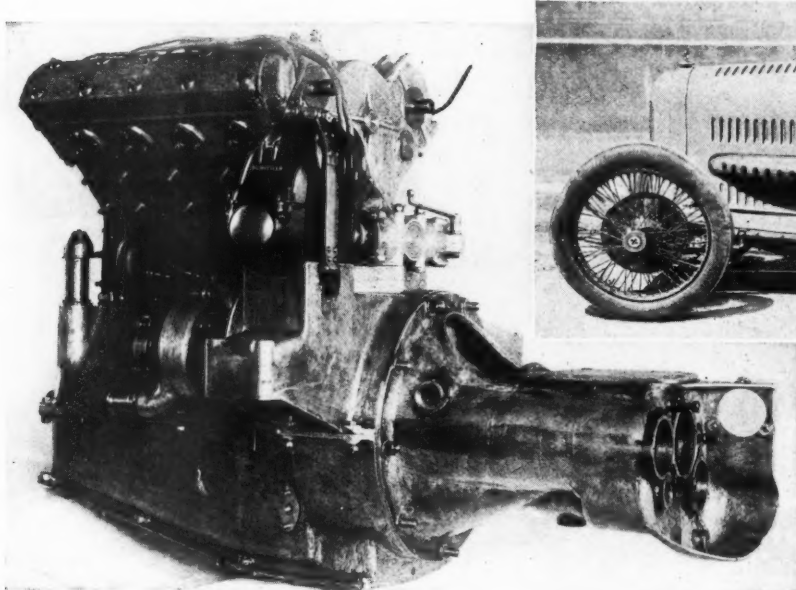
The new radiator also is extended to the Ford truck chassis, affording better cooling in delivery service.

General Motors Adds a 2-Ton Truck Chassis

A NEW 2-ton chassis has been added to the line of General Motors Truck Co. to fulfill the demands of lumber men, furniture dealers and some bus operators. The wheelbase of the new chassis is 191½ in. For truck service this amounts to an elongation of the previous standard chassis when the latter is intended for bus service. A vacuum fuel feed system, pneumatic tires, special fenders as well as a large capacity generator and optional 6 to 1 gear are available at increased price. The 191½-in. wheelbase chassis lists at \$2475.



Seventy Horsepower From a 91-Cubic Inch Engine



The Talbot-Darracq 91-cubic inch piston displacement racing engine and one of the cars in which it is placed. Roller bearings are used throughout in the engine with the exception of the wrist pins

SEVENTY horsepower at 5000 revolutions is the output obtained from the new 91.5 cu. in. Talbot-Darracq racing cars which will make their first appearance at Boulogne on August 30 and will run in all the European long-distance events of the present season.

The new cars are built to the same general design as the 122 inch six cylinder Sunbeams, which won the French Grand Prix. The cylinders are separate steel forgings united by a common sheet steel water jacket and have two valves

inclined in the head at 42 degrees. Drive for the two camshafts is at the rear by means of a train of spur pinions, with bevel gearing for the cross shaft operating the Scintilla magneto. The water pump is fore and aft. There is a single plug per cylinder, mounted vertically in the head. An advance of 80 degrees being necessary for these high speed engines, provision is made for rotating the armature.

Roller bearings are made use of throughout this engine, the only part

having plain bearings being the wrist pins. The connecting rods are I-section with split ends, the bearings also being in two parts and having the rollers in direct contact with the shaft. There is a separate bearing between each cylinder and one behind the timing gear. Lubrication is of the dry sump type, with a direct delivery of oil through the hollow shaft to the main and connecting rod bearings. Pistons are aluminum with floating pins.

New Sightseeing Motor Stage Built by Fageol

ANEW type of sightseeing motor bus, designed especially to enable passengers to see the country, and adapted for either long or short hauls, is being built by the Fageol Motors Co., Oakland, Calif. The bus embodies the latest luxuries of motor travel, with 49-inch plate glass windows, low center of gravity, and stability on the road.

The chassis frame is built with a goose-neck over the drop-center front axle, a kick-up over the inverted worm-type rear axle, and underslung springs, bringing the frame down so that the floor of the coach is only twenty and one-half inches from the ground.

Outriggers are used to anchor the body, while 36x6 pneumatic tires on steel disc wheels, single at the front and dual at the rear, are used to give easy riding qualities, also making it practicable to operate with only one spare tire. Gruss air springs supplement the long steel springs. Service and emergency brakes of the internal expanding four-shoe Timken type operate inside a 4x21-inch drum, the same size as used on Timken three and one-half ton truck axles.

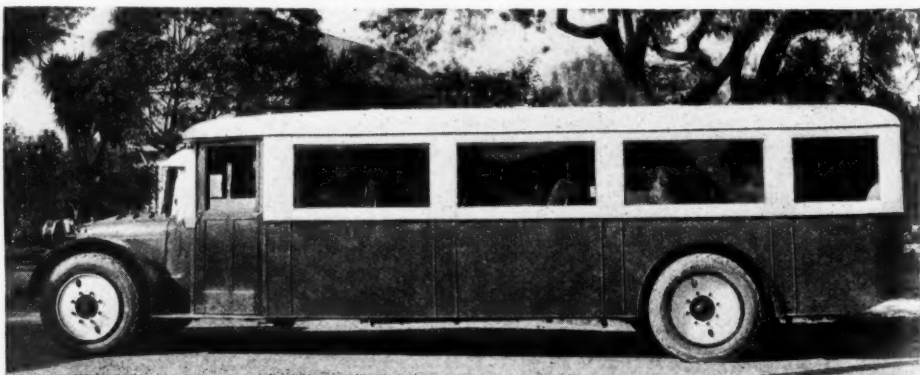
The engine is a Fageol-Hall-Scott, four cylinders, $4\frac{1}{4} \times 5\frac{1}{2}$, with overhead cam and valve action; Delco starting, lighting and ignition system, with $2\frac{1}{2}$ in. main bearings, forced feed lubrication,

and enclosed sealed governor, set at 1800 r.p.m. The engine weighs 750 pounds, has a taxable rating of 26.9 h.p., and develops 62 horsepower at the governed speed of 1800 r.p.m. This engine does about 10 miles per gallon of gasoline with the sight seeing body, under full load.

The interior of the body has been planned to meet the needs of two types of sight seeing work, short trips occupying less than half a day and the long distance trips of one or more days. For the short trips, where the maximum number of passengers must be carried at low fares, leather upholstered street car type seats have been provided for 29

passengers. For the long distance tours, large capacity has been considered of less importance than maximum comfort, and a type of individual overstuffed wicker chair has been adopted which permits the carrying of 22 passengers. The upholstery is of wool mohair velour, with luxurious finish and fittings.

Interior woodwork is finished in mahogany or walnut, in hand rubbed varnish, while the outside is painted with Pyralin or liquid celluloid, by the Rynamel process, giving an egg-shell finish of durability and permanence of color and making it possible to clean the cars with hot or cold water, gasoline, kerosene or distillate.



Engineering for the Service Man

No. 4

Reasons Back of Ignition and Valve Timing

THE question is often asked, "How should the spark be timed on a Chevrolet?", or "Where should the spark lever be set on a Packard?", or the question may be, "Is it possible to have too much spark advance on a low priced car, and not on a high priced car?"

If the matter of timing were one that a designer could arbitrarily decide, we might feel that a table giving the exact timing of each car would be helpful, but the question about timing would never be received by us if the principle on which gasoline engines operate were thoroughly understood.

In Fig. 1 we show a boy riding a bicycle, and at the instant shown in the sketch he has just thrown his weight on the right pedal. Which way will he drive the bicycle? Forward of course.

In Fig. 2 is shown the same boy on the same bicycle, and this time the pedal is in a different position, when he applies his weight. Which way will the bicycle be driven? Backwards if it has been standing still, while if the bicycle had been moving, the first effect of the boy's weight will be to slow it down. After the pedal gets over center, then of course the weight of the boy will again act to drive the machine forward.

In Fig. 3 we show a simple engine, with a piston, two valves and a spark plug prominent in the sketch and we know that firing of a gas charge in the space above the piston will cause a pres-

sure that will push the piston down. The piston is fastened to the upper end of the connecting rod, while the lower end of the rod is attached to the crankshaft.

We will assume that the charge of gas is fired and the pressure exerted, when the parts are all in the positions shown in the sketch. Which way will the engine turn? To the right, or clockwise, of course.

Now in Fig. 4 we will take the same engine and figure that the charge of gas is fired and the pressure obtained when the parts are in the position shown. In this case it is easy to see that the force exerted will spin the engine to the left or counter-clockwise.

Suppose the boy of Fig. 2 wanted to drive his machine forward. He would fail to do so and it would go backward because he is applying the pressure too soon. Suppose that in Fig. 4 we wanted to drive the engine forward, which we will say is right hand or clockwise. We would fail in the attempt if the spark occurred too soon and gave us the pressure above the piston when the parts were in the positions shown in Fig. 4.

An advanced spark is one that occurs soon or early as far as the rotation of the engine is concerned. The point from which we figure is that at which the piston is highest in the cylinder, or when the connecting rod is up and in line with the arm of the crankshaft. A late spark or retarded spark is one that occurs later than the advanced spark, that is

when the engine has moved farther in the normal direction of rotation.

Advance and retard, then are relative terms, meaning sooner or later.

Why Retarded Spark Is Needed

It is the spark of the modern engine that fires the gas so that the timing of the spark determines to a great extent the time that we get the pressure on the top of the piston.

Therefore in order to crank the engine and get it to running in the right direction we must delay or retard the spark so that it does not occur until the piston has come up and has started down on the firing stroke. If the spark occurs too soon the engine will kick back.

Suppose the boy riding the bicycle should wait until the pedal is nearly down before he would put his weight on it. He would get but little speed. On the other hand for greatest speed he steps on the pedal when it is up and lets his weight act all the way down.

In the same way in the engine we must not have the spark too much delayed or the power of the engine will be reduced.

Why Spark Advance Is Needed

The gas does not explode, in the sense of burning in no time for it does **TAKE TIME FOR THE GAS TO BURN**. The combustion starts at the spark plug and spreads through the gas to all parts of the cylinder, but at high speed, while the flame is spreading the piston is moving



Fig. 1

Pressure on the pedal after it gets over top dead center drives the bicycle forward



Fig. 2

Pressure on the pedal before it gets to its top position drives the bicycle backward or slows it up if already in motion

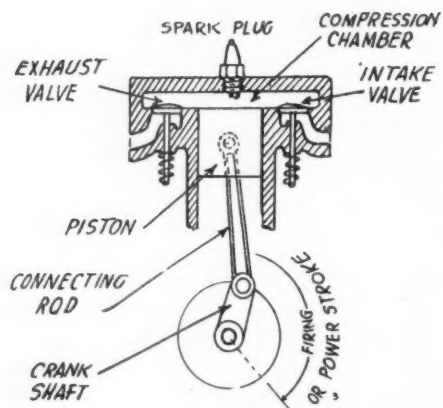


Fig. 3
With parts in position shown, firing of charge drives engine clockwise

and going down rapidly. This means that the maximum pressure is not obtained at high speed, until the piston is part way down, if the spark occurs when the piston is on top dead center. That is why spark advance is needed.

These principles do not vary in different engines although the amount of advance required may vary. Whether the car is in the low priced class or one of the most expensive, it must follow the same timing rules, and the piston must get up over top dead center to make cranking safe, either with the starter or by hand.

Then when the engine has started and is running at comparatively high speed, the spark must occur sooner, and this holds true in all engines. The exact amount of spark advance for best results can be found by trying different positions. There is no other way, for variations in the gas mixture, the speed and throttle opening will all affect the exact amount of spark advance needed.

What It Means in the Shop

Suppose a car you never heard of before comes into the shop and possibly, because it is overheating or knocking, you wish to check the spark timing to see if it is correct. You do not need any specifications on this particular car, for it works like all the rest. Perhaps you do not even know which way the levers on the wheel should be for retard.

The lever position can usually be checked by working the gas lever and watching the throttle lever on the carburetor. The accelerator pedal will always move the throttle to the open position. Then move the gas lever so that it does the same. With the spark lever moved the same way you have the advanced or high speed position. FOR CHECKING THE TIMING put it the other way, for this will be the retard position.

The car may have a battery ignition system or a magneto, but the timing can be checked just the same for no matter which system is used, the sparks will occur when the interrupter contacts just start to separate.

Then the thing to do is to relieve the compression by opening a cock in each

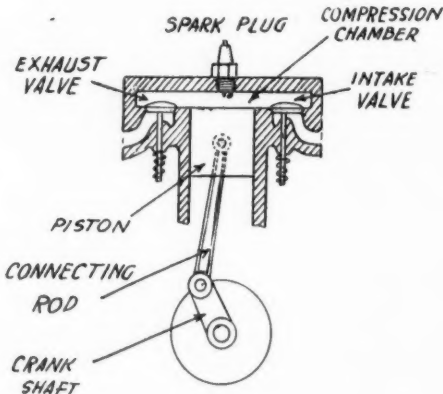


Fig. 4
If piston is not yet up to its top position, firing of the charge will make the engine kick back

cylinder or taking out the spark plugs so that the engine can be turned easily by hand. With a thumb over the plug or pet cock opening in the No. 1 cylinder you can now crank the engine until air blows out past your thumb.

This means you have the piston coming up on the compression stroke, and the point you want is where the piston is at top position or possibly a little down on the firing stroke. This does not mean to have the piston a half inch down or even a quarter inch. A sixty-fourth or perhaps a thirty second will do no harm.

With the engine in this position, and the spark lever retarded as previously mentioned, the interrupter contacts should be about to separate. They should not be open already for that means the firing position had already been reached, or that the timing is too early. To tell whether the points are ready to separate or not it is possible usually to slightly rock the interrupter shaft one way and the other due to play in the coupling or gears and in one direction the points should just open while in the other they should close again.

The advance position will take care of itself in most cases assuming the ignition device correctly designed. Cases sometimes arise however, where over-

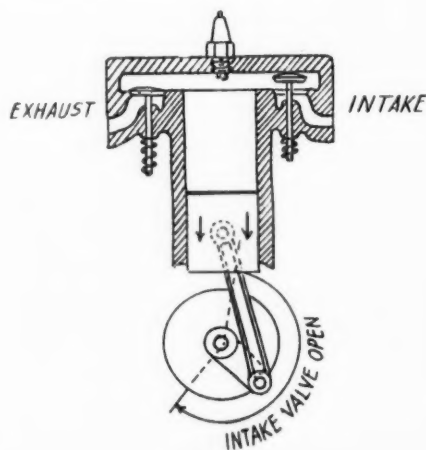


Fig. 6
Downward motion of piston draws fresh gas into the cylinder

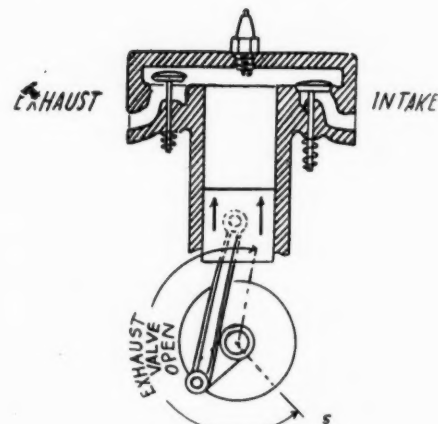


Fig. 5
Burnt gas is driven out by upward motion of piston with exhaust valve open

heating is experienced with systems having automatic advance where possibly the springs are too stiff in the governor assembly. It is then possible to advance the spark slightly in the retard position but great care is required for if too much advanced the engine will kick back if cranked slowly, and may injure the starter.

What the Valves Do

Each time the cylinder of an automobile engine fires, it burns up the fuel and must get more before it can again deliver a power stroke. To get the fuel into the cylinder we need a valve which will open for this purpose, and then close again when the engine fires, to prevent loss of power.

It is also necessary to have some way to get rid of the old gas that forms when the fuel is burned. This means that every automobile engine must have an exhaust valve and an inlet valve in each cylinder.

Referring to Fig. 3 again we may consider that the spark has occurred and the pressure thus produced by the burning fuel has caused the engine to turn clockwise. After the piston has gone down, it will then start to come up in the cylinder and if at that time the valves are still closed, we would have the engine stopped by the imprisoned gas. It is accordingly necessary to let the gas out on this stroke, which we call the exhaust stroke.

It would therefore seem as if the exhaust valve should be opened when the piston is at the bottom of the stroke, but as it opens gradually it would not be fully open until the piston had traveled up part way. This would mean that the piston would have to move against back pressure of the old gas, and would subtract from the power of the engine. For this reason it is customary to have the exhaust valve start to open considerably before the piston gets to the bottom of its stroke, and while the exact position may vary in different engines it is often about 45 degrees early.

This is indicated in the sketch of Fig. 3 where the power stroke is shown to end before the piston gets all the way down. This is not strictly true, for even

with the exhaust valve starting to open, the pressure can not be dissipated instantly, and work will still be done on the piston by the expanding gas. Then by the time the piston does start up again, there will be practically no pressure for it to work against. The duration of the exhaust stroke is shown in Fig. 5 and as indicated the valve usually does not close until slightly after top dead center. Here again the delay is due to the need of thoroughly getting the old gas out.

As soon as the old gas has been expelled, it is time to open the intake valve so that new gas may be drawn in the next time the piston goes down. Here again the timing may vary slightly in different engines, but an average setting would be with the exhaust valve closing ten degrees after top center and the intake starting to open 15 degrees after,

which would be 5 degrees after the exhaust valve had closed

What It Means in the Shop

Perhaps the car that came in with a knock due to the spark, or with overheating trouble due to a retarded spark, does not behave as it should even after the ignition timing is known to be correct. It may be a car on which little data is available, but the general conditions of valve timing are so similar in different cars that in perhaps ninety-five out of a hundred the same timing would give good results.

We do not need to worry about the exact time that the exhaust valve opens or the intake closes, for these take place toward the bottom of the stroke and are not so easy to check. However, if we get the upper events correct, these will have to be right for the same cam shaft governs both. Then when we consider

that most engines today use but one cam shaft, we have the job still further simplified, for if the timing of any one valve in any cylinder is right, all the rest will have to be.

Then with this unknown car we can slide a thin piece of paper between the push rod and the valve stem on the exhaust valve of any cylinder and turn the engine over until the piston in that cylinder is coming up with the valve open (the paper pinched between the push rod and the valve stem.) As the engine is cranked further a point will be reached where the paper is just released so that it can be pulled out without tearing it. This is the point at which the exhaust valve has just closed. If the piston at this instant has come up to its top position and has gone down again about one thirty second of an inch you will have the valve timing about right.

23 Years Ago This Week In Motor Age

(From MOTOR AGE of Aug. 30, 1900.)

Madison Square Garden Show

NEW YORK, Aug. 27.—All the floor space has been taken for the automobile show at Madison Square Garden, Nov. 3-10. The demand for space has been so great that it has been decided to floor over the boxes on the north side of the garden and also to exhibit automobiles in the restaurant.

The following manufacturers will exhibit their products. National Automobile & Electric Co., Riker Motor Vehicle Co., Winton Motor Carriage Co., F. A. LaRoche & Co., De Dion-Bouton Motorette Co., United States Automobile Co., L. M. Harris, The Autocar Co., Foster Automobile Mfg. Co., Automobile Co. of America, Woods Motor Vehicle Co., Stanley Mfg. Co., Locomobile Co. of America, Canda Mfg. Co., American Electric Vehicle Co., Daimler Mfg. Co., Waltham Mfg. Co., American Bicycle Co., Electric Vehicle Co., Overman Auto Co., Knox Auto Co., Holyoke Auto Co., Jos. Dixon Crucible Co., Diamond Rubber Co., Rose Mfg. Co., Consolidated Rubber Tire Co., Gleason-Peters Air Pump Co., Good-year Tire & Rubber Co., Dow Portable Electric Assistant Co., Chas. E. Miller, Veeder Mfg. Co., B. F. Goodrich Co.

This Was Packard's Pride

The accompanying illustration shows



the latest model produced by the automobile department of the New York & Ohio Co., of Warren, Ohio. The appearance and general design of this model are much the same as those of the company's standard Packard carriage, which has already become favorably known. The special machine illustrated is, however, more powerful and adapted for higher speeds. As in the standard car-

riage, a single-cylinder engine is used, but in the latest design, this engine will indicate 12 horse power on the brake at its maximum normal speed of 800 revolutions per minute. There are four forward speeds varying from six miles an hour to 30 or more, and two speeds backward.

NEW YORK, Aug. 27.—Canopied surreys are now being turned out so rapidly by the Locomobile Co. of America in response to a vigorous demand that orders can now be filled in 10 or 15 days.

What Six Owners Call "Service"

No. 3 A Doctor

A bank president and a salesman have given their views on service in previous issues of MOTOR AGE. Here is given the opinion of a doctor of "his" service station. In forthcoming issues, a housewife, a truck operator and a bricklayer will give their views.

"THERE is a repair shop and second hand automobile store just a few doors away from my office here, where I have all of my work done," said Dr. M. T. Opitz, 5900 S. Ashland avenue, Chicago, "I own a—car and am very well satisfied with it. It has cost me very little but I have had it for only a short time. The men in this shop down here cannot afford to do poor work. They have been in their location for nearly five years now and I remember only one kick about their work.

"I was in there waiting for my car that day when a man in a coupe drove up and strode into the place with murder in his eye. He roared and raged for almost an hour and then, more to get rid of him than anything else, one of the mechanics went out to take a ride with him. He came in a few moments later and I heard him tell the proprietor that the man was justified in making a kick. Immediately, they set to work and made the job right.

"It was handled so nicely that no one could but have the greatest respect for these men. The owner went out well satisfied and apologized. I have seen

him there many times since, buying gas, oil, accessories or tires. I buy my tires and accessories there, too. They do a big accessory and tire business. As for their used cars, they must sell them because there are always different ones on the floor.

"No, I don't believe I know of one suggestion that I might make to this man. His place is splendid—his system is such that he can tell almost to the minute when a car will be delivered. When I had my old—he always gave me preference and one time he got me out on a mighty difficult job in less than two hours. On another occasion he let me take his own car to make a hurry up call.

"I have had few encounters with other garagemen and I know little about how the business should be run, but this much I do know that none of my friends have as much confidence in their repairmen as I have in mine. This condition, however, seems to be a part of the garage business. Instead of selling 'good will' when a garageman sells his establishment, he usually sells suspicion and in a great many cases, contempt.

"What would remedy this? Well, I would prescribe first of all, honesty—honesty all around and then, well the rest would take pretty good care of itself, don't you think?"

Confidence of Customers a Big Sales Asset

*Long Established Business and Definite Sales and Service Policies Largely Responsible for Success of Agner Automobile Co. in Small Wisconsin Town.
Excellent Shop Facilities Help Make Maintenance Pay.
Business Is Gone After*

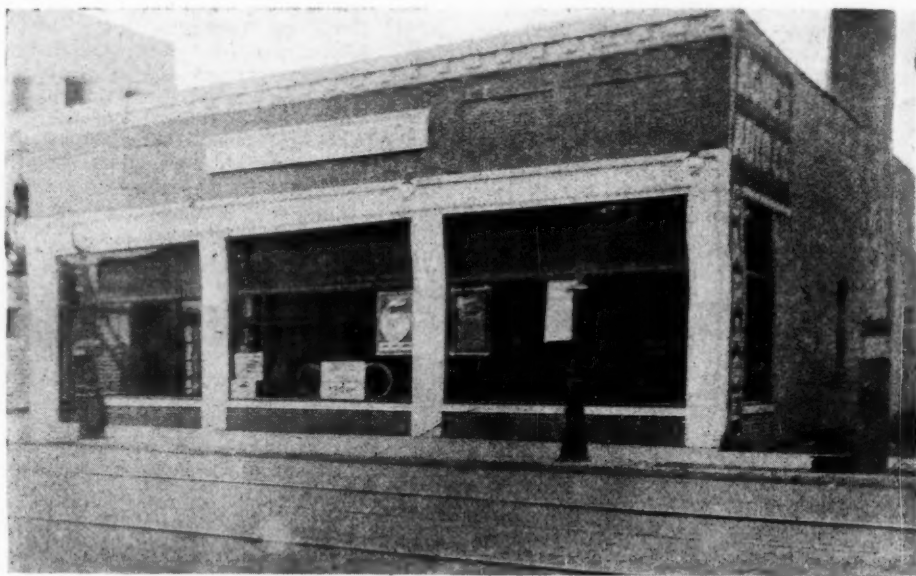
LAST year the Agner Automobile Co., Burlington, Wis., sold 105 Studebaker cars. So far this year the company has sold 87 cars and there is every indication at the time of this writing that last year's record will be broken.

The town of Burlington is small, some 4000 people or so making up its population. And so with that in mind the accomplishment of the Agner Automobile Co. last year and this year is all the more laudable. The company has a building of which it may be justly proud. In fact, one hardly expects to find in so small a community such a handsome, clean and efficiently conducted transportation store.

Reasons for Success

Naturally there is some good reason for a concern selling cars as successfully as does this concern and in sifting down the evidence, we found among some of the outstanding reasons for the success of the Agner Automobile Co., the following:

- 1—The business has been long established (1907).
- 2—The company has handled Studebaker cars exclusively since the first model was brought out.
- 3—Every used Studebaker is conditioned before it is sold.
- 4—The shop is well equipped.
- 5—The mechanics have stock in the business.



The building of the Agner Auto Co. has been so planned that a second story can be added when the volume of business warrants. It is an inviting looking structure and is located on a main highway

6—The company has a definite service policy.

7—The company goes after business.

Hugh Agner, the founder of the business came to these parts a good many years ago and since 1907 has been established in the automobile business. He has instilled a spirit of confidence in the

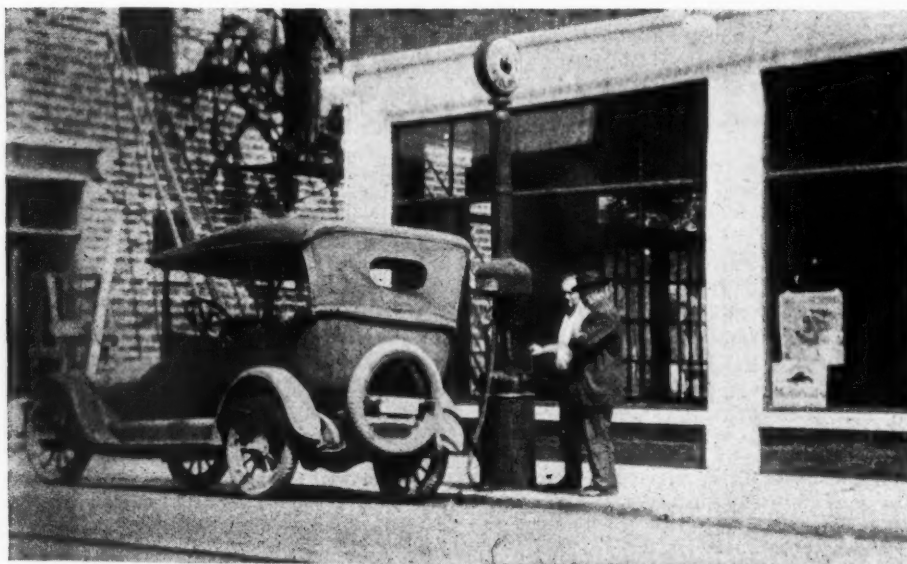
people of the community and there are many who have bought car after car from him. His customers know he has built for permanency and the future. The present building, a comparatively new structure, is laid out so that a second story can be added as the growth of the business may warrant.

Another contributing factor to the success of the company probably lies in the fact that only one make of car has been handled for the last ten years or so. This has made possible the concentration of all sales efforts, service, maintenance on one makers products and furthermore, has made the men in the shop as well as others connected with the business think and act along certain well defined lines.

Concentrate on One Job

The men in the shop, for instance, know the various models which have been brought out from time to time by Studebaker and to that end know the characteristics of all models. They, therefore, know the nature of all repairs and adjustments on these various models and naturally save time in doing their work by thus being familiar with the particular job in question. The mechanics know exactly what tools are needed for the job. Time has taught them short cuts. They think, talk and act in terms of a Studebaker.

The Agner Automobile Co. has made a reputation for itself because it condi-



The company grasps every opportunity to talk business. Here, one of the owners of the business, is shown talking to a customer while he sells him fuel. The customer looks as though he is saying "You are right, I ought to be trading in the car for a new one"

tions every used Studebaker car which it sells. Not a car leaves the place until it has been gone over from top to bottom and put into such condition as the model of the car warrants. The used car which leaves the company is backed with a guarantee very much like a brand new model, so far as the mechanical units are concerned, which have first been inspected and rebuilt in the shop if necessary.

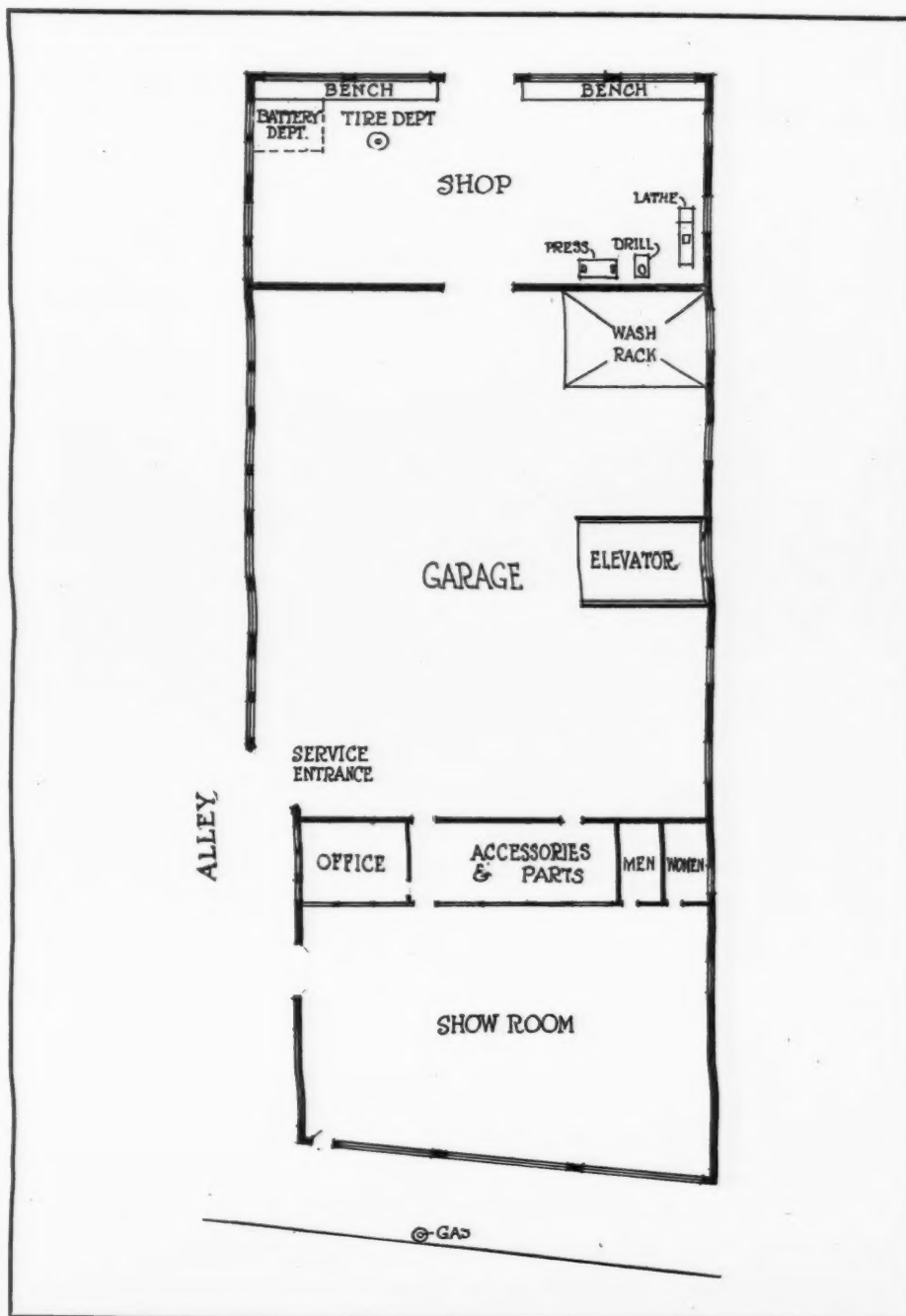
One of the surest ways to hold men and make maintenance pay is to give them a part in the business.

The Agner Automobile Co. has a definite policy on service. It knows just where to draw the line on what constitutes service and what constitutes maintenance. The company feels that a customer is entitled to the usual service operations, such as slight adjustments after a few hundred miles running, etc. but it is firmly sold on the fact that such operations as washing the car, oiling and greasing, etc. should be paid for by the customer.

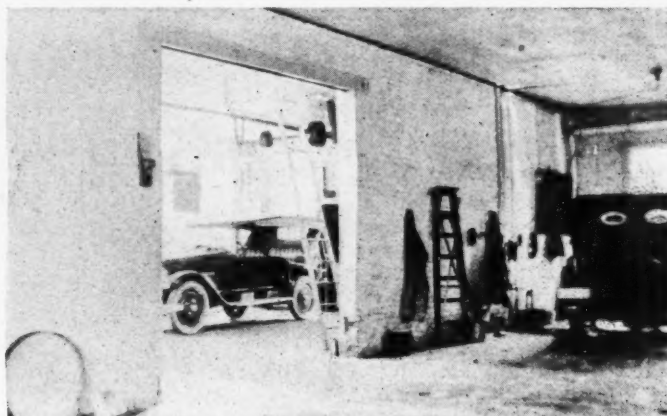
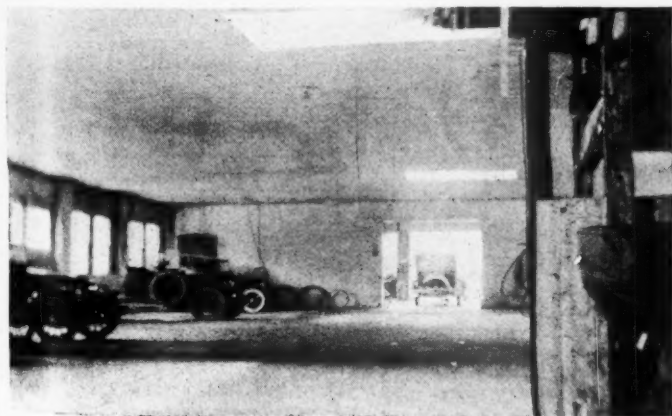
Cars Conditioned for Customer

The company makes sure that the new car is in shape when delivered to the owner. It checks the tool equipment, adjustments, installs the accessories the customer has purchased, tunes the car and does all the other things possible to put the vehicle into the best possible driving shape. Therefore, after having done all this, the company feels justified in charging the owner for all future service or maintenance operations which essentially are those the customer should perform.

The Agner company also has a well defined policy on the sales of new cars. The company does not feel obligated to throw in a bumper or spotlight with the sale of a new car any more than a store throws in a hat after a woman has bought a gown. Of course, it will not haggle over an item which amounts to but a few dollars as compared to the sale of a car. It is a matter of using discretion. But, there is not a promiscuous throwing in of accessories simply to make a sale. Several sales have been lost on this account, but just as many have been made by using good business ethics.



From this ground plan of the Agner Auto Co.'s building it will be seen that the layout is more or less conventional and typical of the small town establishment. It works out very well in practice, because cars can be routed easily



Two views taken in the garage of the Agner Auto Co. Clean floors are an outstanding feature and there is ample light all over the building. Just a bit of the wash rack shows in the right hand picture



So often in a small town the service entrance is hard to drive into. This picture shows the spacious service entrance of the Agner Auto Co. The double doors are used for getting cars in and out of the display room

Go After the Business

And finally, the Agner company is alert to every opportunity to make a sale. Business is gone after. There are two salesmen on the road and in addition to Agner and his associate in the business Runkle, the men in the shop, as mentioned before, are constantly on the job selling cars. It is a case where all in the organization are pulling in the same direction. They are out for business, yes, but, first they have set their house in order, keep it in order, and know they are backed by a reputation ace high in their community.

The only cars which are sold "as is" are those of other makes and which are taken in on the sale of new or used Studebakers.

The conditioning of used cars has a far reaching effect. The people who buy these cars know they are getting a car that is backed by the Agner company and therefore, feel they are not running any chances with an unknown quantity. Furthermore, they are usually satisfied with the buy they have made and the feeling exists that next year perhaps, if they can afford it, they will buy a new car from the company. According to the company that is about the way it has worked out in the past.

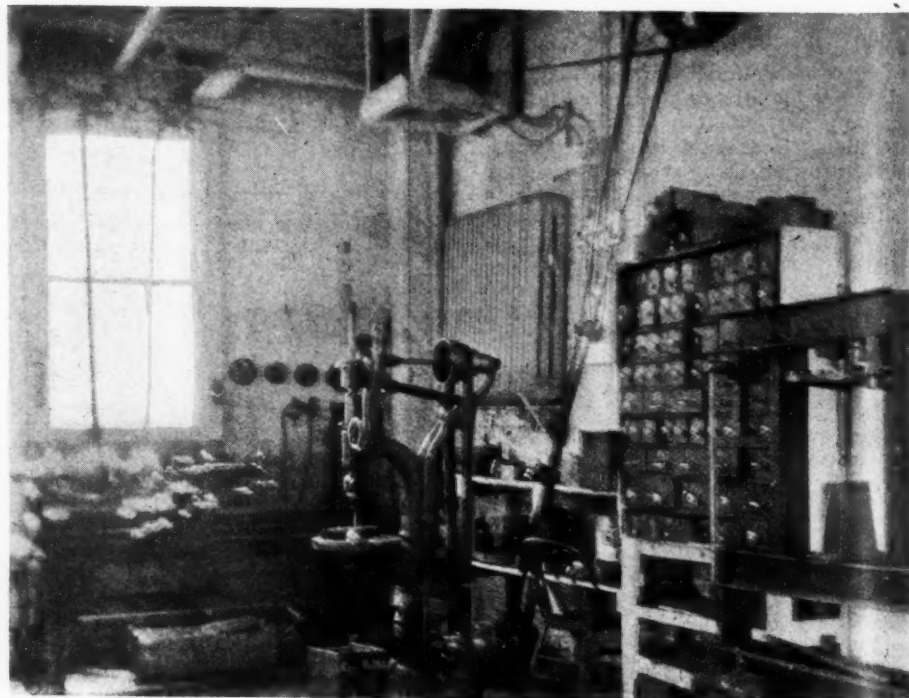
Getting New Sales Prospects

The people who, for example, buy used Studebakers this year are potential customers for new cars next year. The Agner company feels that in having sold a customer a used Studebaker, and then following this up with the right kind of service and maintenance, they have sold the customer on the organization and paved the way for his continued patronage and good will.

The shop is well equipped. Besides a full quota of special wrenches and the usual hand tools, there is a lathe, drill

press, arbor press and so on. The company is prepared to make on short notice almost any part that cannot readily be obtained in stock. And one of the salient things about the shop force is that any man can operate the machine tools. They are machinists as well as mechanics.

The shop is airy and light. There is plenty of room for the men to work. The benches are placed along the east wall of the building and overhead hoist helps to raise the front or rear end of cars, remove engines, etc. The shop



The camera moved when we took this picture, but so do things move in this shop. There is equipment to handle most any operation and all the boys in the shop can operate machine tools. Hence, they can always make a part if it is not in stock and the job justifies it

also contains a battery and tire department.

The men in the shop hold some stock in the business and this, naturally, makes for a high standard of shop morale. It means the men will do their work well. They know as the company prospers, so also will they prosper. They try, whenever the opportunity presents itself, to sell the car and organization. On or off the streets, in the shop or homes of their friends they talk Studebaker and, being able to substantiate their talk with the prestige the organization has enjoyed for many years, they create a good will and pave the way for future sales that cannot easily be measured by any tangible means.

Men Own Stock

This idea of taking the men into the organization is one, we believe, which well might be followed by others. Just as soon as men feel they are a part of an organization they will strive to make that organization successful. We have, for example, the Yellow Cab Co. of Chicago, in which many of the drivers are stockholders in the company. They put forth their best efforts to please the public and perform their daily tasks knowing all the time that they will prosper just as the company prospers. Too often the mistake is made by the dealer's organization of looking upon the mechanics as a necessary evil to the business. The men know it; they are surly and knock the business. They work only for their salary and when Saturday comes forget about the place.

And so, we say here, the fact the Agner Automobile Co. has taken its mechanics into the business is one of the things which has helped put this concern on such a fine footing in its community.

When Is a Magneto Reversible?

Underlying Principles and Their Application to an American Bosch Type DU-4 Magneto

By A. H. PACKER

AN inquiry received by the clearing house department expresses a need for information on reversing the direction of rotation of a magneto. The exact steps to take have to do with setting teeth together in a certain way and probably installing a different interrupter. We could easily say in a few words just what should be done. It seems however, as if need for such advice means that not only the inquirer but perhaps others as well do not clearly perceive the reason why one magneto runs right hand or clockwise and another runs in the opposite direction.

It is certainly not because a workman has stamped an arrow on it pointing in a certain direction, for there are definite electrical and magnetic reasons why slight changes may make the magneto work one way and not the other.

The fact that the magneto generates alternating current is the cause of one of the requirements that make a magneto right for one direction or the other, or if the settings are wrong may make it weak in either direction. Alternating current may be likened to the waves advancing and receding on the shore. A chip of wood may be caught and pushed up on the sand or it may be caught and floated off into the water. At one instant however, the wave hesitates between its upward rush and its backward flow. At this instant there is no motion to the water.

In the same way in alternating current we have brief instants when the current stands still as it reverses its direction while in between these points are periods when it is rushing its fastest in one direction or the other.

For best results we must catch it when its speed or current flow is greatest and this point in the magneto is obtained when the armature is just leaving the tip of the pole. It is also necessary to open the interrupter points at this current peak and have the distributor brush on a segment at this instant. This set of conditions is deemed suitable for advanced spark for most of the running is done with the spark advanced.

Accordingly we have the following conditions that must be met in a magneto of any rotation, for best results:

Requirements in Any Magneto

1. Armature must be just leaving tip of pole.
2. At the same instant the fibre on the interrupter arm must be just striking cam so that,
3. The contact points will be just ready to separate with spark lever advanced.
4. The distributor brush must be just making full contact with a segment, but

must not have passed very far across it. If already well across the segment it may be off when the spark occurs with the lever retarded.

Illustrating these requirements in a Bosch DU-4 Magneto, we see in Fig. 1 that the interrupter lever has been moved to the advance position, which is always against the direction of armature rotation. The arrows show the armature to be going left hand in the illustration although this is a clockwise magneto. This is because the direction of rotation is always considered from the coupling or driving end. The armature is also just leaving the tip of the pole, the fibre is just hitting the cam and the distributor brush is just on a segment.

This means that we have the peak of the current wave, the points will open and produce a high voltage in the secondary winding and the distributor brush being in its right place will carry a spark to a plug. That is all there is to it.

Now let us see what we must do to reverse the rotation. We must get the same condition while turning the armature the other way.

The correct way of doing this involves getting from an authorized station a left

hand interrupter in which all the parts are just the reverse of those in the right hand one. Such interrupters are keyed to the armature shaft with a portion of the brass shell which is punched upward to engage in a keyway. The center screw in the interrupter serves not only to make an electrical connection with the magneto winding but also holds the interrupter on, and in replacing it care must be used to get the key in the keyway.

This is most easily done, by putting the interrupter in place and turning it until the key is felt to allow the interrupter to drop into place. Then the screw may be replaced.

Just the replacing of the interrupter however, is not enough although this does time the opening of the points with the armature and pole position. It is still necessary to set the distributor.

This can be done by turning the magneto over and taking out the ground brush as a precaution to keep it from being broken. Then take off the interrupter and drive end bearing bracket so that the armature may be backed off. Move the armature out about half an inch so that the distributor can be re-

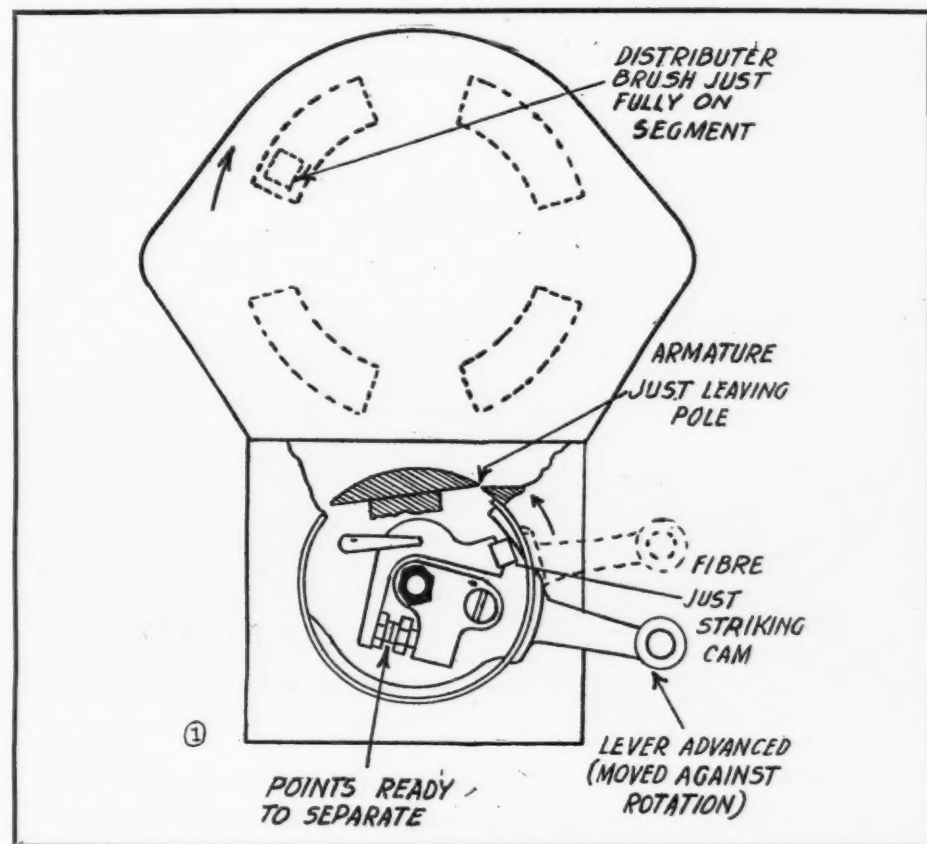


Fig. 1
Proper settings for clockwise rotation

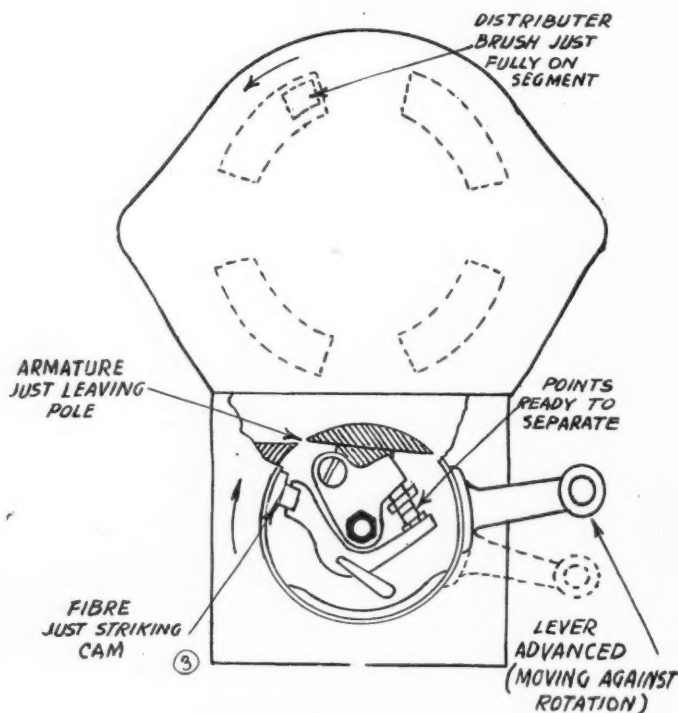


Fig. 2

Proper settings for counter clockwise rotation. Interrupter different from one on the clockwise magneto

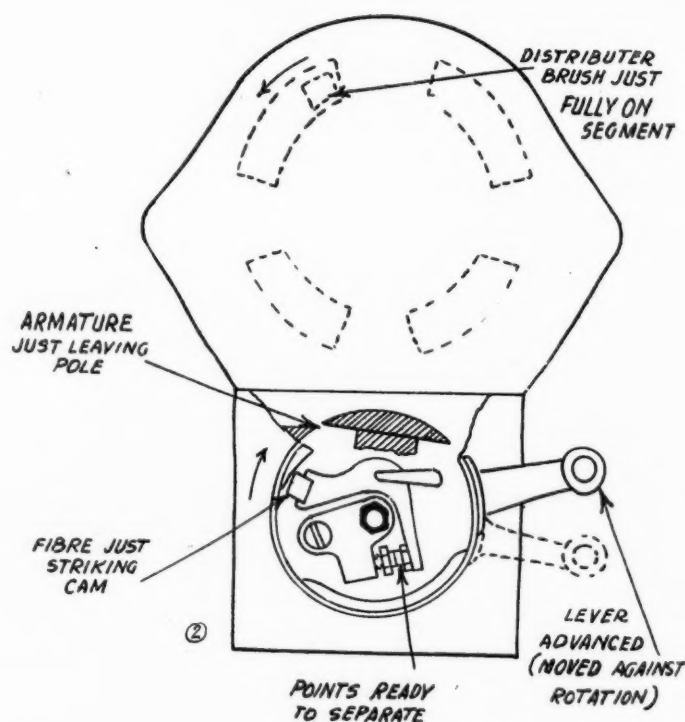


Fig. 3

Makeshift method of converting clockwise magneto to counter clockwise

set. Set it by guess or estimate and then check it.

To do this replace the interrupter temporarily. Put a bit of grease on the distributor brush. Advance the spark by moving the lever against the direction of rotation. Turn the armature in the normal direction, which is now left hand or counter clockwise, until the points are just ready to separate, the fibre being in contact with the cam. Then slide the distributor cap in place so that the grease in the brush will make its mark.

Remove the distributor and see if the grease shows the brush to be in the position indicated in Fig. 2. Is so, then the magneto is properly set. Replace the

end bracket and interrupter, also the ground brush.

Reversing Rotation Using Old

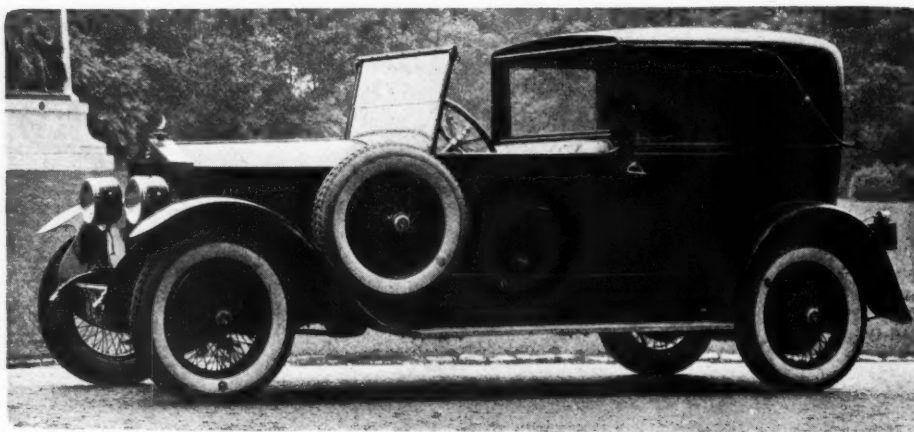
In case of a counterclock interrupter is not available, it is possible to use the regular clockwise one, although it is rather a makeshift method. The interrupter arm will be going in the wrong direction so that theoretically there is a tendency for it to "stub its toe" on the cam. Also to set it properly the key will be found to be in the wrong place. It must then be pushed down out of the way and the interrupter must be held in its right place by the direction of the taper and the tightness of the center

screw which holds the interrupter on.

This is obviously not the best mechanical job, but in a number of cases has been done. The settings for this method of changing direction of rotation are shown in Fig. 3 and the operation will be electrically as good as in Fig. 2 although there is possibility of the interrupter slipping and possibly not working as smoothly when the fibre strikes the cam.

Answering directly the question of our heading, a magneto is reversible when it can be rotated the other way and made to fulfill the conditions first mentioned in regard to armature position, opening of the contacts and distributor brush location.

Moon 6-58 With Rubay Body of Pleasing Design



HERE is shown a Moon 6-58 Salamanca with an especially constructed body by Rubay. It was built for a St. Louis man. The car is finished in coach medium with gold striping and in addition to the silvered radiator has nickelled drum type head lamps, and

nickelled decorative prop irons. The interior of the car is upholstered in gray broadcloth with silvered hardware and the fenders are of special design. The car is equipped throughout with 26x4½ in. wire wheels and with 32x6 in. balloon tires.

Organized for Instant Help

ORGANIZED for instant help in disaster, with stores of food and clothing and emergency supplies housed at strategic points throughout the country, with a network of thousands of Chapters through which it is in touch with the remotest corner of the United States, the American Red Cross is ready at a few hours' notice to bring aid to a community stricken by fire, flood or cyclone.

Since 1881 the Red Cross has spent more than \$14,000,000 for the single purpose of Disaster Relief. In 72 disasters in the United States last year it spent \$1,441,486. In last year's work also fell the relief of nearly a million refugees thrown into Greece by the debacle in Asia Minor. This operation cost \$2,610,000.

Disaster Relief is one of the most important and best known phases of Red Cross work and the Red Cross is asking your support for it through the Seventh Annual Roll Call, to be held from Armistice Day to Thanksgiving.

The Fable of the Bird Who Would Be a Repairman But Was Forced into the Transportation Biz

By TOM WILDER

With Apologies to George Ade

ONCE there was a young Cub with a hankering for automobiles. He was the kind of Bird that didn't make much Noise, but used his Nut quite a bit. When he had finished his Stunt in the red school, which in this case was white, he Pulled Stakes and Steered for the nearest large town.

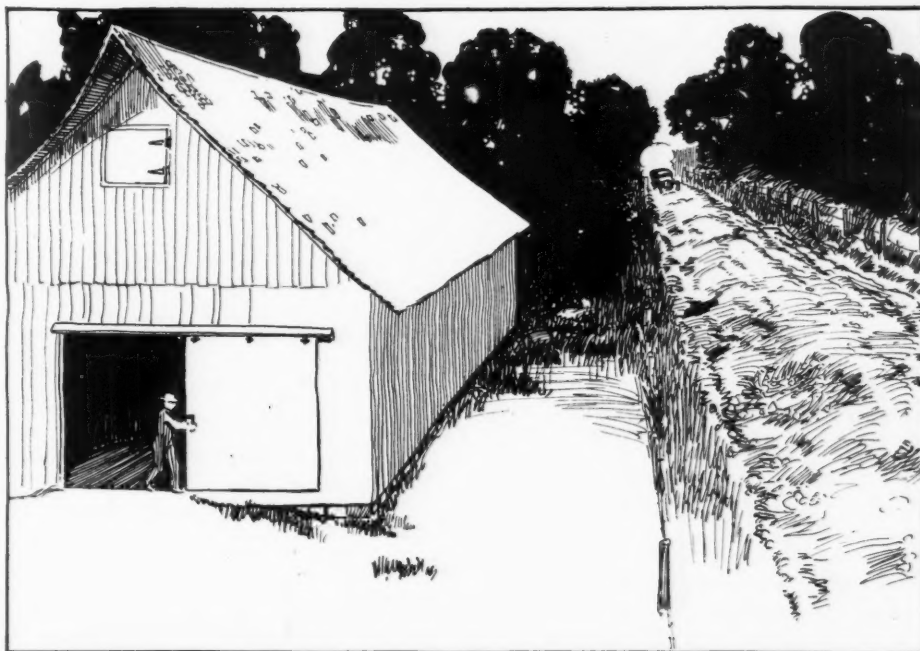
Here he entered the service depart. of the city's most prosperous dealer as an enterprising nut screwer and proceeded to learn the trade with all the fervor of an engaged girl learning to cook and housekeep.

After Frank—for that was the name his parents Hung on him after an intensive search through the dictionary, the Bible and the Encyclopedia of Famous People—had been promoted from sweeper-out to kerosene bath expert and from that gradually up the line until he was entrusted with the most intricate engine timing job, he began to wonder, "Where do I go from here?"

Frank wasn't the kind of a Mooch that sticks in a rut very long, so he is next seen doing a Sherlock Holmes for a location, it being his notion that the Gink who makes the estimates and punches the C. R. is the one who lays aside the Wad at the end of the Fiscal. At any rate he had tried the other end of the Game long enough to know that to leave his heirs 10,000 Bucks he would have to Knuckle Down and Shoot Hard for fifty years, which wasn't encouraging, seeing he was good for only about 30 more of Hard Labor.

Good locations were the Hen's Teeth however, and it was a big job and a gamble to select one that had any promise. All the good roads that carried the heavy traffic were so bespeckled with garages, filling stations and Automotive Dumps of all kinds that there wasn't a chance for a new one without Riding a lot of competition.

Finally he heard that a new concrete road was to be built between two towns that were about 30 miles apart. This road, which was to go through a very barren, desolate country, would be, to some extent, parallel to the present road. The present road was in its day a fine road, but had gone to pieces under the heavy use it had received from autos and trucks and was just about Shot. Although there was a much better road between the two towns, it was about 8 miles longer and most travelers preferred the bad one, as there were only about 12 miles that was extremely bad,



His big idea was to start work in this old barn as a sort of temporary headquarters

the rest being tolerably Rotten.

Frank did a lot of prospecting along this road. First, he got a survey of the new road and located it at all the points he could find with regard to crossroads and the old road. He spent all the time he could looking it over, because he had a Hunch that it would be his future Hang-out. After a good deal of Sleuthing he discovered a place that looked good for several reasons.

In the first place, at this point the two roads, the present and the proposed, came very close together. In the second, the point was almost in the center of the bad road. In the third place, there was a crossroad that would connect the two roads and was a fairly good road and led to a live though small town about 5 miles away. In the fourth place there was a pretty good-sized barn that could be transformed into a usable repair shop with slight expense, which was quite important, as his financial limit was not very flexible.

His Big Idea was to start work in this old barn as a sort of temporary headquarters, using it while the new road was under construction, which would be two years.

In the meantime the county commissioners would not Blow a Jitney on the old road because it would be a dead loss

and all their Jack was needed for the new. As a result accidents to running gear were of almost hourly occurrence. On a nice Saturday afternoon or Sunday cars with broken springs, sprung and broken rear axles and tire trouble, literally lined the roadside.

By setting himself up here he could Cash In on all this trouble for the next two years and at the end of that time have capital enough to finance a good-looking place on the new road and be Sitting Pretty when it was opened.

The short future of the old road prevented others from starting up in competition because there were no other existing buildings and no one would build under such circumstances. Even before he started up he got an option on a strip of land where his crossroad would intersect the new road. Here he made a slight mistake, for the new road proved to cut his lot in two and he found he had two corners instead of one. As soon as he opened up his shop he knew he would have no trouble in taking up his option, so he did it at once, for fear the owner, who was a non-resident, might reconsider in view of the increased value given the property by the new road.

Frank put in a stock of springs likely to meet most requirements and built a service car with a crane that would



The present road was good in its day but under present heavy use was just about shot

bring in anything that still had two wheels of its own. It would be impossible to keep a force large enough to handle the crowd on Saturday and Sunday, as, by comparison, the travel was light the rest of the week, so his plan was to tow in the wrecks and fix them up during the week. On a fine Sunday his yard would be full to overflowing. The traveling public didn't Fall For the system pleasantly, but people were at his mercy and there was nothing else to be done. It was, of course, their own hard luck if they broke down on this God Forsaken stretch, but it was not as bad as it might have been, for there was an interurban station not a half-mile down the crossroad that enabled them to continue their journey or go back home and come later for their cars.

Frank tried to be as fair as possible; he did every job in the order received, and always kept his promise on delivery time, though he would sometimes push a job ahead where the customer was willing to pay for overtime. Most of the little Shake Loose jobs were finished on the spot, unless they got to coming too fast, at any rate he aimed to send them on their way if it was humanly possible.

He had a monopoly and knew it and though he did not abuse it as some might have done, he was dealing mainly with city folks and charged city prices rather than prices current in the country.

Once in a while he made a mistake and soaked a Rube on the City Scale. One poor, old Tightwad from down in the Sticks Threw a couple of Fitts and made violent protest in this wise. "Ten dollars for weldin a axle housin. Say, mister, aint it bad enough to shake the day lights outen a feller an bust up his bus goin through this stone-quarry you got the nerve to call a road without cheatin' em out of 'is eye teeth in the bargain?"

"Your in luck," said Frank, "and don't know it. You have no Wail-a-tall. 'Spose I wasn't here with my little old shop, then what'd you do? You'd have to get someone to come way over from Jonesville or Palmer and tow you in. Towing charges'd be most as much as I've

charged you. Maybe they wouldn't charge as much for the work; maybe they would. All I know is what it costs me. I don't intend to put the Bee on anybody, neither do I intend to stay out here in the wilderness for my health alone."

Things came Frank's way more and more. At first the regular travelers of the road looked askance at him and his old barn, but as soon as it became noised around that he was a Regular Guy, An Expert and was Up to Snuff, they began to stop for service rather than at the city places. He had a way of not saying much, but Bouncing trouble on the Bean with little or no fuss, which was very pleasing to customers.

Frank had never Wised Up on accessories and was inclined to Sidestep them. He had learned his trade as a service man and intended to stick to the service business positively and without Frills. He had not progressed very far however, before he was Hep To a never-ending line of inquiries for this, that and the other, King pin among them being tires.

One morning when he opened up he found a Gink sitting on the step Registering Hope. "Ah, said the Gink, I've been Roosting here for an hour. Buss up the road half a mile with two blowouts including spare. Up against it for fair. Got to annex a tire of some kind or What have you?"

"Sorry," said Frank, "but we don't handle tires."

"Don't handle tires?" said the Gink. "My Gawd! On a road like this and don't handle tires! Can you beat that! Marshall Field on State Street and don't handle silk stockings! Say, where'd you learn the garage business? In a machine shop I'll bet. Say, old man, you're overlooking more coin than common sense allows. Here's me willing to pay any price for anything that'll hold air and you can't deliver! Good Night!"

Concentrating on the possibilities at the end of the first month, he remembered that there had not been less than 40 inquiries for tires. If he had Hung sales on even 30 of these, and there is no reason why he should not have Nailed 100% of them, he would be at least 150 Bones more to the good than he was.

Now 150 Simoleons in the till with no effort and very little work was not to be sneezed at and he began to realize that there were some advantages in the Store-Keeping Stuff that he had overlooked. He also reasoned that if 40 people had inquired for tires where there were no tires visible, at least double that number would seek to buy if there was a display to draw their attention. He was so well sold on the idea that he hired a carpenter and built a lean-to on the old Barn with a show window and everything. It was cheap, nothing but lumber and plasterboard, but it would answer the purpose for two years, just as well as a more elaborate and expensive structure.

Along the same line Frank began to think about gasoline. While he had always looked upon it as a mere Catch Penny, devoid of dignity, he now realized that it was a necessity. The

numerous inquiries led him to believe that in view of the extreme distance between stations, it was Up To Him to furnish gas service and also air whether he made a profit on the sales or not. Even with no profit it would put him in touch with customers who would want other articles as well as repairs and it was a Cinch there would be no loss with reasonable care.

There was another angle and that was that when his plan was consummated and the new building completed it would need a good filling station as a Come-on, so why not put in one pump now and later move it to the new location.

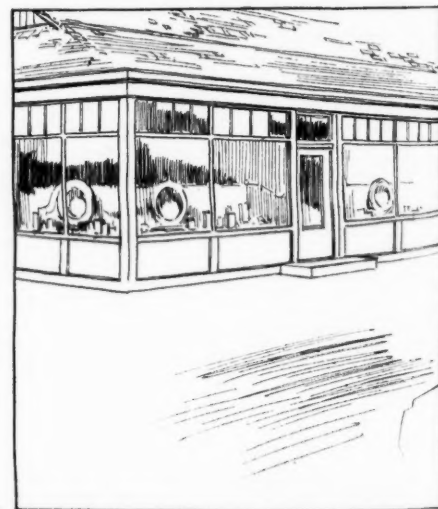
The pump was no more than installed before he was forced to hire a couple of boys to operate it in two shifts from early morning till late at night. On Sundays they pumped him dry regularly till he added another tank and kept it full for emergency use.

Almost Before Frank had a chance to Get Wise to himself he had become the proprietor of a Transportation Emporium and his C. R. tinkled merrily from dawn till after dark.

As yet car sales were not a big item on his balance sheet and he had no idea of taking on a car agency, but twice he had bought wrecks for a song, which seemed Down and Outs to their owners; these he had Teased into new life by a little Mechanical Slight of Hand and a liberal use of polish until, displayed by the roadside under a sign, they Shanghied a buyer for themselves and 50 per cent profit for Frank.

Thus Frank found himself heels over head in all branches of the transportation business. Simply because choosing a location where everyone else was afraid to take a short-time chance he had, almost without capital, jumped into a trade that was not equaled by any other for miles around.

He regretted the short life of his venture, but pushed every line of action to the limit, knowing that if the time were longer competition would be stronger. He knew that when the new road was opened he would have plenty of competitors to Buck and it was his present



He hired a carpenter to build a lean-to on the old barn with a show window and everything

desire to Soak all the Coin possible, for then his overhead would do a hurdle to one hundred times its present modest percentage. He must do his Picking while the Picking was Good.

So he Picked and Soaked away with all his might till the winter of the second year, then he began to plan his new place, for the road would be opened some time the next summer, most of it was already in use and he wished to dedicate the new Dump the very day the new road began to function past it. He also wanted to have his building pretty well under way before the busy season opened, so that he would have the full use of his time, for his section of the old road was now considered a detour for the new road and the traffic would be twice as heavy as ever before for the new road had already commenced to Pull.

He visited all the latest and best equipped buildings he could hear about, making sketch floor plans of the best. These he studied and compared, combining the best features with his own ideas until he had a plan that he considered as near right for his use as anyone could make it. Then he retained an Architect to work out the details and design a front that would Make a Splash on the landscape. He had a few arguments



"Don't handle tires?" said the Gink. "My Gawd!"

with His Pencil Pushing Highness over points of architecture, but garage principals finally prevailed with architectural accompaniments rather than an architectural solo. Frank was up to date on these things and when the Architect seemed about to win a point, Frank

appealed the question to MOTOR AGE Architectural Department and got the dope that made him the Winner.

As soon as spring opened, work on the new building was started and pushed to the limit, so that by the time heavy traffic commenced only the finishing was to be done.

Work was delayed on the road so that it was pretty near fall before the big day of the opening arrived and Frank had more time than he needed to get everything in apple-pie order. When he finally did close the old place, he left it vacant the rest of the season, but adorned it with a mammoth hand pointing to "Frank's New Place," about two city blocks down the road. He also retained the lease and later sub-let it to a fellow who wanted to open a Creamery, thus stifling any competition that might otherwise spring up.

The new place was a Whiz from the start. It looked better and showed farther than any other establishment on the new road, and for that matter, within a radius of 50 miles. It was not so large, but was sure Built to Show and Made Good on its specifications.

Moral—It's O. K. to Cash In on the Hard Luck of Others.—The Doctors Have No Monopoly.

DAV'S DIARY

AUG. 20—Onest the Boss is the biggest crab i ever saw but theys one thing about him he dont pull any of his crab stuff on the customer wich is a good thing for the business wich i taking it all out on me and Art wich dont care much us being ust to it.

Today he got to hollering about keeping the place clean and neat wich is a good thing to holler about and i apruve of a place being kep clean but when us fellows works 9 or 10 hrs. per day and has to akount for every minute of the day on our job tickets i dont see how we are going to do much cleaning up until fall comes and we have some spare time.

In spite of being so nice to the customer he would just as soon have us clean up the shop and charge it to the customer wich we hapent to be working

Instruments for Use or Ornament

MARGIE giggled. She always giggled when Al tried to make her be serious, and this morning he was taking things altogether too hard. "It's all right," said Al, "To call the cowl board a picture frame if you want to, and to figure the instruments are fancy clocks, but if you don't know how to read what those clocks say the new car may lay down and play dead some day."

"It won't either," said Marge, now starting to pout, "It's a good car, the man said it was and it wouldn't ever give any trouble, so there." Al was puzzled.

"Didn't the salesman or any one else over there explain anything about the car or what it needed?"

on wich according to my way of thinking isent the right way becuz then one customer has to pay the whole thing if he doesnt kick wich he usually does if they is much cleaning done. What he should do is charge the customer more per hr. then we would make our wages and have mabe a hour left every day for cleaning up and sharpening tools and fixing things that get busted and fixing up stock and all the other little things wich they is always plenty of.

Of course he could charge a bigger profit and charge the cleaning up to himself but if that bird charged a bigger profit then he would get tight and want to keep it al himself and the customer would get stung again just as he does now so it aint no use and we might as well let the place go dirty cuz i for one wunt make one customer pay it all.

"Not about those nickel plated things, he just showed me which of the little pancake turners to step on and how to wiggle that stick around, the one that catches on your cape as you get in."

Marge ran off leaving Al in contemplation of what would happen to that salesman if the car should misbehave when some highly important function demanded its unfaltering service. Later in the day he dropped in at the dealer's establishment, determined to find out a few things. Careful inspection of the cowl board did not reveal any great complication, at least to the average individual.

There was a clock and a speedometer, to which no introduction is needed. Three other instruments were used, one marked Oil, one Amperes and the other Gas, and as Al was looking them over,

the salesman on the floor came up and wanted to know if he could be of service.

"You sure can," said Al, "I want to know what you tell the people that buy your cars, as to the care they need and what the gages are for; you remember Dad bought one for Sis a short time ago."

"Yes, I remember, but it doesn't make much difference whether the customer is a man or a woman, about all we have time to do is show them how to drive, where to put the gas, water and oil and let it go at that. The information they need is all in the instruction book.

"But," objected Al, "Suppose the buyer never reads the instruction book, doesn't know what the ammeter or oil gage should read and has trouble with his car."

"Well, that's their funeral, not ours," said the salesman. "We have done our part."

"Technically you may be right, but if something goes wrong with that car when Sis has a date, she will never forget it. Even if it's her own fault she will blame it on the car, so it seems to me it would be well to at least tell car buyers what the readings on the gages should be and also tell them to drive into your shop if the gages do not register. Of course you can not explain to the women what amperes are but you could easily tell them that the needle should point at ten or whatever is about right."

"Even the men who drive cars do not always know what the gages should show, the gas gage doesn't say whether its gallons or pounds pressure, and when the oil gage is marked from zero up to one hundred, I suspect that some of the salesmen themselves would be at a loss to say what the needle should register under certain conditions."

The salesman looked uncomfortable and said nothing.

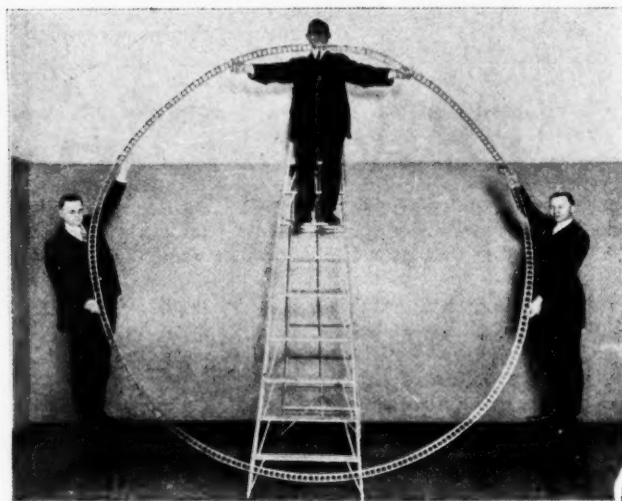
MOTOR AGE'S PICTURE PAGES



Betty and Peggy Gregg are the most daring of a troupe of "stunt" drivers who have been exhibiting in Trenton, N. J. Their most startling performance is the descent of this steep incline, one behind the other. As they leave the incline one car turns a triple loop while the other passes beneath it



The Gregg sisters cars' caught at the moment of their sensational flight. They are said to attain a speed of 130 miles an hour in the descent of the incline

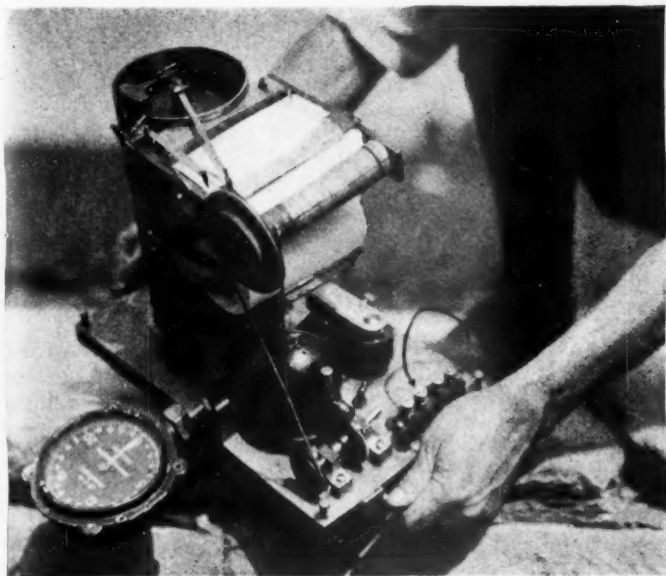


Here is the world's largest gasket according to the claim of the manufacturers, the Victor Mfg. & Gasket Co. of Chicago. The great size of this gasket is made apparent through contrast with the height of the three men



A typical example of the artistic bridges being built by the Illinois State Highway Department, in connection with its hard road program, is the structure just completed on the D iagonal Trail, between Bloomington and Peoria

OF AUTOMOTIVE INTEREST



This instrument primarily designed by Dr. W. S. James of the Bureau of Standards as a recording decelerometer for testing brakes, can be converted by a slight change in the pen linkage and inertia weights to an accelerometer for measuring the speed of car acceleration



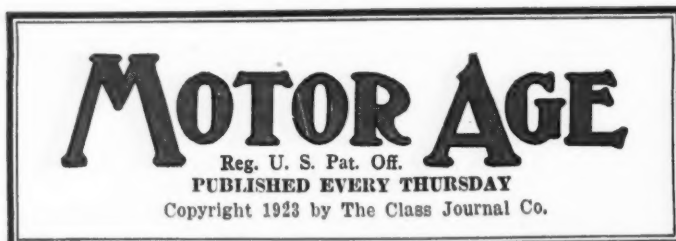
Wm. Robert Wilson, President of the Maxwell Motor Sales Corporation



The Brooklyn Eagle party which recently toured Alaska are shown here in the famous Keystone Canyon, near Valdez, which is the coast terminus of the Richardson Highway



In this U. S. Navy seaplane, NW2, Lieutenant A. W. Gorton made a new seaplane record, over the Delaware River course, flying at an average speed of 177.5 miles an hour. Gorton is shown here in his plane just before starting his record flight



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Pay and Profit

ONE hears from here and there of automobile dealers who are getting The Transportation Store idea that all departments should pay a profit. Usually these men begin with the shop, which has always been a financial leak or at least not a profit getter. Once their attention is turned to this department with an idea of profit, the thought dawns on them that they have no right to expect a profit when they consider what they are investing.

The shop manager's salary very often tells the whole idea. This man does not get as much as the junior salesman, at least not more. He has been put there to "fix cars" and that is exactly what he is doing. He was not put there with the fixed idea that he was to make friends of every Runwell owner in the community and that he would be paid in proportion to his success. There is many a shop manager who today is "fixing cars" who could and would make friends for the house if it was made plain to him in conversation (backed up in his pay envelope) that he was the most important cog in the entire establishment.

Very few men will do things in spite of their employers and there are more dealers in this country who are adding weight to the safety valve than are furnishing fuel to make their shops prosper.

Look over your shop accounts and see whether or not you are making a profit. If you are not, why not? Are you paying the shop foreman or superintendent what he earns or should earn? Especially the latter.

Have you ever put him on a basis that is comparable to that of the salesman or is he just fixing cars?



Grease, grime and unsightly exteriors turn people away from garages.



State Meetings

THERE were several interesting incidents at the recent Pennsylvania State Meeting which, as might be expected, ended in a way which reflects credit upon the view the automobile dealer takes of his annual state gathering.

The Pennsylvania Automotive Association is a youngster in the point of years, but by size and finance it has taken a position of leadership among state organizations. Therefore it is particularly pleasant to record instances that indicate that this leadership is in good hands.

One of these instances come up when a motion was made that the next annual meeting be held in Atlantic City, where a large measure of pleasure might be mixed with the business of the annual meeting. Instantly there was decided opposition and the serious leaders recalled that three state meetings had been held, earnest business meetings with only a fair amount of pleasure and that these meetings had accomplished something for the members. It was stated that the next annual meeting would be held just before the gathering of the next legislature and there was likely to be much serious work. At the vote, Wilkes-Barre won the 1924 meeting by an overwhelming vote.

The other incident relates to voting. It had been decided that the president should be elected at the annual meeting by the members, instead of by the board of directors. It was decided that each firm having a paid up membership should have one vote. The registration list was gone over, firms were asked to name the voting delegate and to pay up delinquencies. There were kicks and disputes, of course, but in the end all paid up. The Pennsylvania Automotive Association election was one of the wonders of modern business organization elections and the treasurer of the association took \$600 home from the annual meeting with him.

More power to the P. A. A. and to the precedent it is setting. Its work has been worth \$300 a year to each dealer in the state and it should prosper.



"Associations have accomplished definite results in making business more pleasant and more profitable."



Some Clean Sales!

IT was an interesting experience a few days ago to look over a list of substantial citizens of an eastern community who do not own cars. This list was compiled by a dealer and he had been working on it only a few weeks and had made more clean, cash sales during this period than he had for three years previous.

This man had heard that a list company had such a list for his community and had sought to buy it. He was told that a rival had bought the exclusive rights to such a list from this company and so this man had compiled one of his own. A bright young salesman and two girls had combed all available directories and had made inquiries until their list was quite a lengthy one. It surprised every banker and merchant in the community who had seen it.

In this case, circumstances favored this dealer. The competitor who had bought the list knew that he was to have a 1924 car sometime later in the summer and fall and he had put off intensive work until he had literature on the new models, merely baiting the list with some general literature. All of which helped the dealer with the home-made list.

The results were so amazing that they ought to bring home to every dealer in the country the possibilities of a non-car owner list.



Well bought is half sold.



Associations

ONE is constantly confronted with the type of association that is organized without any definite idea of where it is going or why it was organized. Some of these associations were organized to provide a job for the promoter and some were organized merely because organizations are fashionable in business.

It is well for any association to stop and examine itself once in awhile and ask, Why? If there is no answer, there are only two things possible, if the members are going to get the worth of the money they put into the association and the time they devote to it. These two things are:

• Create a why for the association and work to the goal.

Disband and save time and money.

As strongly as MOTOR AGE believes in trade associations, we are of the opinion that the automotive industry, especially the dealer industry, would be better off if some of the associations would disband. This is not a general opinion, because we believe that most of the associations are doing a good work. A frequent cause of an association losing its objective is that it was organized for a certain purpose and when that purpose is completed, no new leads are injected into the program.

An association without an objective, is like the ship of the Ancient Mariner and is about as much use to commerce as was this ship.



If you break even you can't exist.



The Transportation Store

WE have it on the authority of some tire dealers that MOTOR AGE is all wrong in advocating that car dealers sell tires. Also we are informed that electrical service is entirely distinct and apart from any other automotive service, hence it should be performed in a separate establishment. There are apparently good arguments to support these contentions, but

the trouble with these arguments is that they do not give proper consideration to the man who pays the bills, the car owner.

It would appear that instead of a rule that tires cannot be sold in an automotive dealer's establishment, or that battery and electrical work cannot be done in his maintenance shop, there should be an economic study of when this can be advantageously done. We are quite willing to subscribe to the statement that tires should be sold by a tire man and that electrical and battery work should be done by an expert electrical mechanic.

But is there not a point when the dealer who sells cars finds himself in a position to add tire, electrical and other specialized departments, and is it not a rule of economy that when the dealer reaches this point that it is more economical for his owners for him to do this?

The automotive industry in its broad sense should include all things for the motor vehicle owner. The industry should seek to make it as economical as possible for this owner to obtain his transportation. The vehicle organization that can bring about the economy in sales, maintenance and further equipment of the car is the organization that will make the best record for economy in distribution through resales to satisfied owners.

Where dealers have not yet sufficient cars in the field to justify a complete shop and the employment of experts in the several lines, then there is a place for the independent specialized shop, as one of these shops can cater to the owners of many makes of cars.

The entire question, however, is one of economics and not of rule.



"It pays to consider the customers interests and tell them the unvarnished truth."



Showing Merchandise

ONE of the amazing things that come to the man interested in automotive sales as he drives through the smaller cities is the number of automobile and truck dealers who have no display windows and no adequate salesrooms. In riding through the smaller cities, you see two or three signs in a town "Authorized Runwell Sales and Service" and not a sign of a window or a salesroom.

Evidently a good many automotive manufacturers have been striving for numbers of dealers rather than for quality. When you ask one of these windowless dealers how many salesmen he employs, he looks at you in amazement. Most of these men had had little automotive experience until they took the "agency" for the car they are supposed to be selling.

In viewing these sales outfits, one cannot help wondering why more successful salesmen in the larger towns are not persuaded to become dealers in the smaller cities and to put some real selling punch into their efforts, or why more independent repair men who have demonstrated their ability to pay rent are not turned into salesmen. When the latter course is followed, there should be some requirements besides that of buying a demonstrator and putting up a sign.

The automobile dealer business will never take the place that it should have until the requirements for it are at least equal to those of the chain grocery or cigar store. Many manufacturers apparently expend their full measure of pride in the large centers of population.

Production Takes An Upward Trend

Output This Month Likely to Surpass That of July

Sales Have Improved Following Introduction of New Models, Especially in Cities

NEW YORK, Aug. 27.—Increased activity in automobile manufacturing plants the first two weeks of August indicates that the output for the month will be considerably in excess of that for July. A similar condition prevailed a year ago when, following a let-up in July, August took a pronounced swing upward which made it, next to June, the highest production month of the year. It is not expected, however, that this August will so closely approach the banner month of 1923.

Production totals of this year have followed to a large extent the course that marked the monthly manufacturing activities of a year ago, with the exception that the high point in output was reached a month earlier this year than last. The last five months of 1922, after the slowing down in July, showed a healthy average in the number of motor vehicles produced. The movement upward that came in August, however, was not strong enough to carry production for the remaining months of the year at the same high level and September showed a material drop.

Improvement in sales is noted in many sections of the country following the announcement of new models and the general retail sales curve is again moving upward. More intensive selling this year than in the past is expected to keep the volume from showing any trend in the opposite direction.

Buying in cities has been exceptionally well sustained, but farming districts have not yet absorbed cars in the volume anticipated. It is still somewhat early to judge of the disposition of the farmer, generally, to buy. In some agricultural states, interest in motor vehicles has been notable, especially during the last few weeks. In Iowa, for example, the resumption of tractor demonstrations is reported, with a number of sales made at the first of a state-wide series.

Motor truck production which declined slightly during July is again moving forward and the likelihood is that current schedules will remain in force for the balance of the year. The demand for passenger bus and rail car chassis continues strong. Farm areas have shown a more wholesome tone in their purchases of trucks, but as yet the full power of this market has not been felt.

Parts makers report business at a high point, August proving an unusually good month and the outlook for September being even better. This branch of the industry is experiencing somewhat of a labor shortage, particularly of the

skilled character. A greater number of unskilled workers is reported, these being rapidly absorbed and enabling the parts producing plants to keep output well sustained.

Hitching Posts Down, Parking Signs Up

SPRINGFIELD, Ill., Aug. 25.—Dobbin has lost his standing with the state fair folks at last.

Walter W. Lindley, general manager of the Illinois state fair, has ordered removal of the hitching racks from the fair grounds, thus following, he says, the general trend throughout the state. Last year only five horse-drawn vehicles were tethered at the racks, which have been institutions of the fair since the pioneer days. The farmer visitor worries now about how to park his car.

Steinmetz to Make Electric Passenger Cars and Trucks

BALTIMORE, Aug. 25.—A reorganization of the personnel of the Steinmetz Electric Motor Car Corp., accompanied by a refinancing which is expected to add \$300,000 to the working capital has taken place whereby G. M. Walker, who has acted as general manager and treasurer in the company's formative stage, becomes president as well.

At the same time it is announced that the company, in addition to manufacturing the Steinmetz electric truck, also will bring out a passenger car, built on Steinmetz principles, which will be listed in the neighborhood of \$2,000. It will be an enclosed car and in appearance will resemble the gasoline type of automobile, although depending upon electric motive power. Dr. C. P. Steinmetz, designer, expects to develop a mileage that will give the new model something close to 100 miles on one charging. While the new passenger car is not yet in actual production, 100 trucks are about to be put through in the factory at Arlington.

CHARGE FOR BATTERY SERVICE

BURLINGTON, Ia., Aug. 25.—Six battery firms in this city, including the leading downtown concerns, have announced that after Sept. 1 a charge of 15 cents will be made for hydrometer tests and addition of water and 25 cents for cleaning and greasing terminals and tightening holdowns. Free battery testing service has been in effect at the stations here five years.

PREMIER MAKES TAXICAB

INDIANAPOLIS, Aug. 28.—A taxicab priced at \$2910 is now in production by Premier Motors, Inc. It is powered by a Buda W. T. U. 4-cylinder engine and contains many other standard units.

Collins to Stay at Head of Peerless Under New Contract

Salary of \$150,000 a Year Will Be Adjusted—\$65 Bonus to Be Eliminated

CLEVELAND, Aug. 27.—Richard H. Collins will remain as president and active executive head of the Peerless Truck & Motor Co. This was declared at a meeting of a special committee named to consider his resignation, submitted to the board of directors at the time stockholders suits were instituted some weeks ago.

Under terms of the agreement reached between President Collins and the committee, his salary of \$150,000 will be adjusted on a mutually satisfactory basis. Collins stated that the commission of \$65 a car sold by the company as paid to him during the last year will be eliminated under the new agreement.

The outcome of the meeting is considered by those closely informed as to the affairs of the Peerless company to complete the vindication of Collins' regime as executive begun with the vote of confidence by stockholders of the company a week ago at its corporate headquarters in Richmond, Va.

Exact terms of the new contract negotiated between Collins and the directors committee were not disclosed.

Floating of Part of Big Bond Issue May Be Willys' Next

TOLEDO, Aug. 25.—Financial interests here close to the Willys-Overland Co., believe that the next move of the management will be to float a part of the \$15,000,000 bond issue which was approved by the stockholders at their last annual meeting early this year.

The payment of the \$6,930,000 of bank indebtedness, removing the last of the bonded debt of the plant this month, made a considerable drain upon the liquid cash of the company despite the record-breaking earnings which have characterized operations for the last seven months.

Net capital actually increased \$2,232,143 during the first six months of the year and approached a total of \$17,000,000 in the working capital accounts.

Earnings in July and June were nearly \$2,000,000 and business in August has continued at very near that rate.

The issuance of the bonds or a portion of the issue is held to be almost entirely dependent upon the continuance of the high earnings for the remainder of the year. Additional money raised through the bond sale would allow for balance sheet adjustments and put the company in an impregnable cash position, it is pointed out by local financial authorities.

What Is Dealer Outlook for Rest of Year?

Stockholders' Committee Buys Winther Assets for \$130,500

Will Form New Corporation With \$500,000 Capital to Resume Operation of Plant

MILWAUKEE, Wis., Aug. 27.—The stockholders' reorganization committee of the Winther Motors, Inc., Kenosha, Wis., has finally been declared the successful bidder for the assets in bulk and the sale at \$130,150 has been approved by the referee in bankruptcy. The only other bulk bidder was the E. L. Essley Machinery Co., Chicago and Milwaukee, which offered \$127,500. The stockholders' committee has been granted three months' time to make complete payment. It will meet Sept. 1 at Milwaukee to arrange payments and to make plans for resuming the operation of the plant as quickly as possible. A new Wisconsin corporation with \$500,000 capital is to be formed at once by the committee.

Not until Thursday, Aug. 23, did it appear likely that the committee would be successful in getting control of the property. The public sale was conducted at the plant on Aug. 16, as scheduled, and the only bulk bid, which was not even entertained, was \$50,000. Parcels were then bid in for a total sum of \$65,000, but did not embrace the real estate, buildings and essential machinery.

These bids were reported by Trustee A. B. McCall to a meeting of creditors held in the office of Referee Milton J. Knoblock in Racine on Aug. 18, and a postponement to Aug. 22 was ordered, there being likelihood of an acceptable bid for the property in bulk being tendered. On Aug. 22 the trustee reported that the stockholders' reorganization committee and the E. L. Essley Machinery Co., Chicago and New York, had put in the bids of \$127,500. A second postponement to Aug. 23 was then ordered and the trustee requested to secure new bids which might not be equal. On Thursday the stockholders' committee offered \$130,150 for the property, the Essley company bidding \$128,500, and the stockholders' bid was thereupon accepted, with assurance of confirmation by the Federal court at Milwaukee.

Dr. E. W. Timm, 922 Third Street, Milwaukee, is chairman of the reorganization committee, and Edward C. Kraemer, Milwaukee, is secretary.

PERSONNEL OF FLINT PLANT

FLINT, Mich., Aug. 28.—The executive personnel of the plant that will manufacture W. C. Durant's Flint car here has been announced by W. E. Holler, general manager of the Flint Motor Co. W. H. Farr, who has been associated with Durant enterprises for 16 years, will be factory manager. Frank Stern, formerly with Durant Motor Co. of Indiana, will

be comptroller. R. M. Tayler will be supervisor of purchases and director of materials, and E. G. Rice will be traffic manager.

Other appointments include Joseph E. Clark, assistant traffic manager; Roy Herrlich, local purchasing agent; A. D. Cuthbertson, personnel, and C. H. Turner, office manager.

July Production 327,102 According to U. S. Figures

WASHINGTON, Aug. 25.—The Department of Commerce announces July production of automobiles, based on figures received by the Bureau of the Census and covering approximately 90 passenger-car and 80 truck manufacturers each month.

AUTOMOBILE PRODUCTION

	Passenger Cars		Trucks	
	1923	1922	1923	1922
Jan.	223,706	81,693	19,398	9,416
Feb.	254,650	109,171	21,817	13,195
March	319,638	152,959	34,681	19,761
April	344,474	197,216	37,527	22,342
May	350,180	232,431	*43,013	23,788
June	*337,143	263,027	*40,616	25,984
July	297,104	224,770	29,998	21,837

*Revised.

H. H. DOERING RESIGNS

CHICOPEE FALLS, Mass., Aug. 28.—H. H. Doering has resigned as sales manager of Rauch & Lang, Inc., after serving in that capacity since the formation of the company three years ago. He was also vice-president and member of the board of directors. Prior to his connection with Rauch & Lang, Doering was sales manager for three years for The Baker R. & L. Co. of Cleveland, Ohio, which at that time was manufacturer of the Rauch & Lang Electric Automobile.

BATTERY PRICES REDUCED

INDIANAPOLIS, Aug. 28.—Substantial reductions in prices of batteries for all makes of automobiles have been announced by the Prest-O-Lite Battery Co. At the new prices, the farmer can buy a new battery for his car with fewer bushels of wheat than was possible in 1908, and he also gets a better battery than was manufactured at that time.

GARRIGUS PROMOTED AT HAYNES

KOKOMO, Ind., Aug. 28.—Ross H. Garrigus has been appointed advertising manager of the Haynes Automobile Co., it was announced today by Gilber U. Radoye, director of sales and advertising for the company. Garrigus has been assistant advertising manager for the last year.

TRUCK MAKER DIES

CEDAR RAPIDS, Ia., Aug. 27.—Martin Beck, 80 years old, founder of the Hawkeye Motor Truck works and head of the organization, died suddenly last week.

C. A. Vane of N. A. D. A. Discusses This Question

Bulletin Issued by Manager of National Association Points to Prosperity

ST. LOUIS, Aug. 28.—What is the automobile dealer business outlook for the remainder of 1923?

In a bulletin of the National Automobile Dealers' Association, C. A. Vane, general manager, who has recently visited all sections of the country, discusses this question as follows:

"From virtually every important distributing point in the country this question has been asked of the National Automobile Dealers' Association in the last month, indicating that dealers this year as never before are giving thought to planning their business activities rather than meeting them haphazardly, as they come.

"It is with a great deal of satisfaction, therefore, that we who have been conducting extensive investigations and analyses of business conditions are able to say at this time that the four months of the remaining year should be months of continued activity and profit, with little indication of anything more than the usual seasonal recession to which we have always been accustomed.

"I have just returned to headquarters after a trip over the United States in which I have visited since the first of February every principal automotive distributing center in the United States, except Boston and many of the smaller ones. During that time I have covered some 50,000 miles, have talked to more than 30,000 people in the trade (dealers, salesmen, servicemen) from the platform and have interviewed dealers, distributors, bankers, business men generally by the scores.

"The most notable thing at this time in the trade, to my way of thinking, is the great strengthening of the dealer morale, the determination that the dealers are exercising to handle cars in a way that will make profits for them, or at least leave their new car profits untouched by the trade-in. I don't say that this is being done, I say that the dealers are attempting to do it, some of them with marked results.

"I believe that those in the industry who have been in as close touch with conditions in the field as we here in N. A. D. A. headquarters will agree with me when I say that dealer morale reached its lowest ebb last winter. By that I mean the lowest it ever has been in the history of the trade. There was more discouragement, more surrender to be found than during the winter of 1920-1921 with its heavy price cuts and the serious

(Continued on page 33)

Mellon's Daughter Admires But Doesn't Buy French Car

**Secretary of Treasury Says He Was
Glad She Didn't—He Tells
About Industry in France**

WASHINGTON, Aug. 25.—High grade French automobiles are very attractive and are very pretty to look at.

There can be no objection to one admiring them. But when it comes to buying one of these gasoline choo-choos—well that is something else again. Even for one who is reliably reported to be financially able to buy a car-load of the best French automobiles and to give them away without fatal results to the bank roll.

Still, French cars come high and those with lots of money are not always keen to get one even to gratify the wishes of a charming daughter. Only in this case the daughter merely looked at and admired a car but did not ask her distinguished father to buy it.

The father is Secretary of the Treasury Andrew Mellon. Upon his recent return to the United States from a trip in Europe he spoke of the extremely prosperous industrial and crop conditions of France, and incidentally revealed a sense of humor for which the public has not adequately credited him. It seems that the Secretary with his daughter Miss Alisa was looking at automobiles of beautiful French design.

"My daughter was very much attracted by one design," the Secretary told newspaper correspondents at the first conference he held with them since he returned. "But," he added with a quiet smile, "I was just as well satisfied when she said she did not want me to buy it."

Turning to a more serious discussion, the Secretary of the Treasury said that the automotive industry in France is running at full blast and that the earliest possible delivery that can be obtained on any French car of quality is four months. French manufacturers, he said, told him that they are exporting about 20 per cent of their cars, England and the United States constituting the principal foreign markets.

New Series of Tire Tests to Be Made by U. S. Bureau

WASHINGTON, Aug. 25.—A new series of tire tests will soon be made by the United States Bureau of Standards to determine the relative wear on various kinds of roads. The Bureau has just placed an order with one of the rubber companies for the making of 50 tires, using various amounts of reclaimed rubber in the tread.

After manufacture, these tires are to be tested in the laboratory and also on trucks of the Post Office Department over four different types of roads, in order to determine the wear of the different compounds.

Interesting Sales Figures for Six Months Shown by Illinois and Indiana Reports

CHICAGO, Aug. 28.—Spring, with the advent of the touring season, proved to be a marked stimulus to automobile sales in both Illinois and Indiana, and in both states by the time the improvement had reached the peak the relatively low figures of January and February, the winter months, were doubled. A compilation of new-car registrations for the six months of 1923 reveals total sales of 92,954 passenger cars, a monthly average of 15,492, for Illinois, and 64,157 for Indiana, or at the rate of 10,692 a month. In Illinois 39 per cent of the aggregate consisted of Fords, while in Indiana the showing was slightly in excess of 50 per cent.

Ford's greatest sales in Illinois were in May, with a total of 8,199, and in Indiana in March with 7,426. With the exception of Fords the sale of medium-

price cars was in both states substantially in excess of the lower-priced vehicles. The figures follow:

	Low price excluding	Medium Price
Illinois	Ford 17,917	32,829
Indiana	12,629	17,048

Cook county in Illinois, in which Chicago is located, was the leader with sales of 37,004, of which 11,481 were Fords. In Indiana Marion county, in which Indianapolis is located, led with sales of 10,198, of which 4,897 were Fords. Sales in each state for June were in excess of the average, the total for Illinois being 18,374 and 11,788 for Indiana.

The following table shows the sales of cars classified according to price in both Illinois and Indiana:

INDIANA					
Month	Fords	Low priced excluding Fords	Medium priced	High priced	Total
January	3,871	697	1,138	164	5,870
February	4,206	818	1,131	206	6,361
March	7,426	2,451	3,375	342	13,954
April	6,445	2,917	3,950	498	13,810
May	5,610	2,888	3,893	343	12,734
June	5,120	2,858	3,561	249	11,788
Total	32,678	12,629	17,048	1,802	64,157

ILLINOIS					
Month	Fords	Low priced excluding Fords	Medium priced	High priced	Total
January	4,574	1,380	4,053	1,013	11,020
February	4,183	1,031	3,093	698	9,005
March	5,444	2,190	4,317	685	12,636
April	7,994	4,101	7,225	930	20,250
May	8,199	4,618	7,879	973	21,669
June	6,735	4,597	6,262	780	18,374
Total	37,129	17,917	32,829	5,079	92,954

The foregoing statistics were compiled from detailed figures issued by Robinson's Advertising Service, Springfield, Ill., and Indianapolis Auto Trade Association, Indianapolis, Ind.

OPPOSED TO "PLEASURE CAR"

ALBANY, N. Y., Aug. 25.—A petition has been filed with the State Tax Commission by the New York State Automobile Merchants' Association, the Automobile Merchants' Association of New York City, the Brooklyn Automobile Dealers' Association and motor car owners in general asking for a revision of the application blanks for registering cars which will eliminate the term "pleasure car" and substitute "passenger car" in designating motor vehicles other than omnibuses and commercial cars.

MACK HEADS A. A. A. CONTEST BOARD

WASHINGTON, Aug. 28.—President Thomas P. Henry, of the American Automobile Association, has appointed Joseph Mack chairman of the Contest Board, succeeding William Schimpf of New York who resigned because of ill health. Mack is new in automobile racing, but he long has been an ardent sportsman. He is president and founder of the Joseph Mack Printing House, Inc., of Detroit, and a charter member of the Detroit Automobile Club.

Pierce-Arrow Finance Corp. Ready to Aid Dealers' Credit

BUFFALO, Aug. 24.—The Pierce-Arrow Finance Corp. has been formed to cooperate with distributors and dealers in giving them specialized credit, collection and discount service and to develop a plan whereby new Pierce-Arrow motor vehicles may be financed when carried in stock by the distributor.

The new corporation has a paid in capital and surplus of \$250,000, the entire stock being owned by the Pierce-Arrow Motor Car Co. Myron E. Forbes, president of the manufacturing concern, is also president of the finance corporation, the directors of which include Walter P. Cooke, chairman of the board of the Marine Trust Co., of Buffalo; Roland L. O'Brian, senior member of the firm of O'Brian, Potter & Co. of Buffalo; Lewis G. Harriman, vice-president of the Fidelity Trust Co., of Buffalo, and Albert Strauss, vice-president of J. & W. Seligman & Co., of New York. The management is in the hands of Joseph W. Frazer, vice-president and general manager, formerly an executive of the General Motors Acceptance Corp.

Safety Suggestions Are Approved by N. S. C.

WASHINGTON, Aug. 27.—The following suggestions have been approved and recommended by the National Safety Council, meeting here, as a measure of safety, around private and public garages:

Keep the garage clean, particularly of oils and greases. Place all oily or greasy rags or waste in metal containers. Keep an approved fire extinguisher in the garage at all times; never put water on an oil, grease or gasoline fire.

Do not smoke or use open lights in the garage or around gasoline or oil-soaked rags or clothing. Use only pocket flashlights or portable electric lights.

Remember that when the rear wheels of a machine are jacked up the brakes are not effective. Never jack up a wheel until the other wheels are securely blocked or you are sure that the car cannot move.

Don't work under a jacked-up car; if you can't use a pit, place the car on horses or secure permanent supports.

Drive into or out of a garage slowly, preferably in low or reverse gear. Shut off the engine before filling the gasoline tank, and don't drive too close to the gasoline pump.

146,167,791 Pounds of Rubber Used for Tires in Three Months

NEW YORK, Aug. 25.—In the manufacture of tires and tire sundries in the second quarter of this year 146,167,791 pounds of crude rubber were used, while all other rubber products consumed only 34,252,502, according to a report made by the Rubber Association of America and which includes 90 per cent of the whole. The total sales value of the automobile products was \$142,818,771, as compared with \$85,088,977 for other rubber products.

Pneumatic casings, consuming 104,611,372 pounds of crude rubber, were valued at \$112,515,398, while tubes, using 23,913,971 pounds, were valued at \$17,214,249. Solid tires for motor vehicles were valued at \$8,237,594 and it required 14,998,567 pounds to build them. Tire sundries and repair materials needed 1,455,680 pounds and their value was \$2,902,708.

An inventory of the crude rubber in the United States and afloat for United States ports June 30 showed a grand total on hand of 100,885 long tons, with 27,990 long tons afloat.

DEALER'S TEAM WINS PENNANT

ST. LOUIS, Aug. 25.—For three straight seasons the Cleveland Six baseball team won the pennant in the municipal league here. This year they have lost but two games and with two left to be played need but one victory to assure them their fourth flag. William Groff, secretary of Ward-Groff Motor Corporation, Cleveland distributor in St. Louis, is manager of the team.

(Continued from page 31)

curtailment of credits by the banking interests.

"A lot of this, perhaps all of it, was due to the realization by the dealers that although they had done the greatest volume in their history, had actually handled more motor vehicles, their profits had been virtually nothing. Having been taught for years that volume meant profits, they found to their great amazement that their greatest volume had resulted in virtually no profit at all.

"The first six months of 1923 were a period of reawakening and readjustment. Startled by the disclosures of the National Automobile Dealers' Association that more than \$100,000,000 had been lost on used cars, and this exclusive of sales, reconditioning and overhead expense, there was a greater willingness to hear how dealers who had recognized the merchandising problem in used cars had escaped the difficulty that threatened so many. The influences of the January program of the N. A. D. A. at Chicago, when all the cards were laid on the table and used cars seriously discussed, has been far-reaching. The leadership of this N. A. D. A. here has been worth millions of dollars to the automobile industry. In two or three years time, I believe, that fact pretty generally will be recognized.

"But with the example set before the trade of dealers who had actually undertaken the merchandising of used cars, such men as Barnes of Cleveland, Tate of St. Louis, Gambill of Chicago, Brace of Kansas City, and a score or more in different cities, around whom N. A. D. A. activities centered, there was some definite example, some actual experience and real results that could be held up as a goal to shoot at, and an inspiration for the trade. The trade press during that time rendered an invaluable service by their extensive publication of used car conditions. The discussion was started, carried on and carried home by print and word of mouth. Our own meetings in the trade gave to the men in the business a picture probably that they have never had before and acquainted them with the fact that profits do not come automatically in the sale of vehicles.

"That for the dealer side of it. The other side, that of the buyer, has been an amazing revelation to American business of the desire of the American people for motor vehicles. Production will pass all hitherto known figures. Already the number of vehicles manufactured approximated the total number produced in 1922.

"In conclusion. While all danger of a serious disturbance seems to have passed the next few months are months for caution. The larger finance companies are shortening their lines of credit and taking up the slack in their accounts. The banks have begun to do the same. This isn't discriminating; from their standpoint it's just conservatism, and a customary procedure at this time of the year.

"I feel that dealers ought to be paying more attention in the balance of the year to keeping the profits they have already

23,297 Miles of Road Completed With Federal Aid

WASHINGTON, Aug. 25.—The progress report on Federal-aid highways, made public this week by the United States Bureau of Public Roads, shows that on July 31 a total of 23,297 miles of highways had been completed, with 14,771 miles under construction and 53 per cent completed.

To date a total of \$540,000,000 has been expended on Federal aid highways and \$65,000,000 is being expended for the current fiscal year. Texas, the figures show, leads in highway construction, there being 1,321 miles now under construction in that state. Iowa comes second with 881 miles and Missouri third with 697 miles.

The average cost per mile is \$17,500, the Bureau's figures show. Of this sum 22 per cent is spent for grading, 58 per cent for surfacing, 16 per cent for structures, 1 per cent for shoulder and 3 per cent miscellaneous.

See Your Service Station, Is Brake Advice to Owners

NEW YORK, Aug. 28.—Frequent inspections of automobile brakes by the service station or garage are recommended in literature being distributed to car owners through automobile clubs and other means by the Asbestos Brake Lining Association. The following suggestions for the care of brakes as a safety measure are made:

1. Inspect the lining on the brakes. If it has worn down to 1/16 of an inch at any point, it should be replaced.
2. See that clearance around the drum is equal, if not, adjust the anchor and wing nuts.
3. Make sure that the brake pedal does not touch floor boards. If it does, first adjust brake so it is just free on the drum and shorten the pull rods connecting pedal with brakes by means of turn buckle or adjustment provided for that purpose.
4. See that the emergency does not strike the end of the ratchet or the floor boards.
5. Inspect the surface of the brake lining for grease. If any has worked through clean thoroughly with kerosene and a stiff brush and tighten or renew packing in hub.
6. Inspect brake lining for uniform pressure.
7. Equalize the adjustment for both brakes.

Note: Rules 2, 6 and 7 require expert knowledge not expected of the average car owner. Have your service station or garage man make frequent inspections. He knows how.

made than they take towards profits that they might make by speculative sales.

"It has been a great season. The public has realized that there is more value per dollar in the automobile than any other article of merchandise offered on the market. Our obligation to our public has been met with savings, improvements and stability. It does not require that we give away our profits. Let's keep the profits we have made."

Hudson Production in Seven Months Equals All of 1922

Board of Directors Places Company's Stock on Annual Dividend Rate of \$3

DETROIT, Aug. 25.—Business was so good the first half of the year that directors of the Hudson Motor Car Co., at their recent meeting, placed the capital stock of the company on a regular \$3 annual dividend basis by declaring a quarterly dividend of 75 cents a share, payable Oct. 1 to stockholders of record Sept. 20. Heretofore the company has been paying quarterly dividends of 50 cents each and in addition an extra payment of 25 cents a share quarterly.

In the semi-annual reports it was stated that the company's net income for the six months was \$4,446,039 after all charges, taxes and depreciation, as compared with \$3,041,744 for the corresponding period last year. It was stated that the company had over \$12,000,000 cash or its equivalent on hand and net current assets were estimated to be between \$12 and \$15 a share on the stock.

Production reports show that in the first seven months of the calendar year as many cars were produced as in the full year of 1922, with earnings close to \$6,000,000, or the equivalent of \$5 a share on the 1,200,000 shares of no par common stock. Schedules in recent months have been running close to 10,000 cars monthly, with earnings averaging about \$1,000,000 monthly, so that it is estimated that in the current year the company will earn its \$3 dividend approximately two and one-half times.

Repeal of Ohio Bill of Sale Law Sought by Association

CLEVELAND, Aug. 24.—Amendment and repeal of the Ohio motor vehicle bill of sale law and the enactment of another making the entire matter a part of the registration of motor vehicles under the

secretary of state, is the recommendation of The Ohio Automotive Trade Association. This suggestion, according to E. J. Shover, general manager of the Association, is occasioned by the confusion and inconvenience being reported by clerks of courts, owners, dealers and manufacturers. The present confusion, he believes, could be eliminated if county clerks and others would use only the lawful forms approved by the Attorney General.

Says Next Five Years Will Be Most Spectacular in History

DETROIT, Aug. 23.—Charles F. Kettering, president of the General Motors Research Laboratories at Dayton, O., declared in a speech here to Cadillac distributors and officials that the next five years will be the most spectacular period in the history of the automotive industry. He said the members of the industry most prominent in that period will be those making the most fundamental advances in the perfection of their products.

FIRPO TO DISTRIBUTE STUTZ

INDIANAPOLIS, Aug. 27.—The Stutz Motor Car Co. announce that Louis Angel Firpo, the South American boxer who is scheduled to meet Jack Dempsey Sept. 14 in New York, has signed a contract for the distribution of Stutz cars in South America. He is reported to have cabled his representatives to make arrangements for suitable sales rooms in Buenos Aires and Montevideo, and he proposes upon his return to South America to take personal charge of the business.

GOES TO EUROPE

LANSING, Mich., Aug. 28.—R. K. Jack, chief engineer of Olds Motor Works, has been selected as a member of the General Motors committee on motor car engineering to visit Europe and make an extensive study of European methods and designs. He will sail from New York on the Majestic on Sept. 22.

Monthly Report Shows Slump in New York Registrations

Metropolitan District Has 9,888 Cars in July as Compared With 10,515 in June

NEW YORK, Aug. 25.—A falling off in new car registrations in the Metropolitan district for July as compared with the total reported in June is shown in the monthly automobile sales analysis compiled by Sherlock & Arnold.

The report shows that in July total registrations of cars in all classes reached 9,888 as compared with 10,515 in the preceding month. Aggregate registrations for the first seven months of the year amounted to 60,179 as against 48,064 for the same period in 1922.

Two cars in the low and medium priced class are well in the lead with registrations in excess of 7500; four others are above the 2000 mark, while six others go beyond 1000. In the higher priced class two makes of cars show registrations greater than 1100; three others above 350 and four others in excess of 100.

A recapitulation of the seven months of this year is as follows:

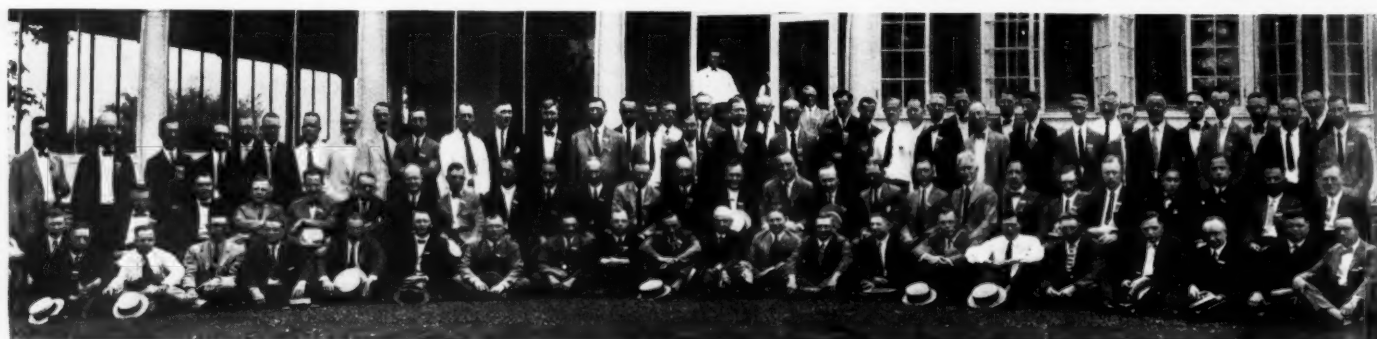
	Medium and Low Priced	High Priced
January	2,814	201
February	2,801	580
March	8,102	769
April	11,124	1,106
May	11,287	992
June	9,782	733
July	9,234	654
Total	55,144	5,035

DORRIS ON AIR COMMITTEE

ST. LOUIS, Aug. 25.—George P. Dorris, president of the Dorris Automobile Co., has been named on the committee which will handle the international air races in St. Louis in October.

One of the biggest features of the event this year will be the Sperry Gyroscope Co.'s searchlight which will advertise the races at night. It generates 1,200,000,000 candlepower and when in use may be seen for 100 miles.

Auburn Distributors' Meeting at Which 1924 Models Were Announced



The Auburn Automobile Co. held its semi-annual distributors' meeting at Auburn, Ind., on July 30 and 31. The business sessions were held at the new Auburn Country Club and were featured by the announcement and showing of the Auburn models for 1924. There are seven new types in the Auburn line, four of the Auburn small six, the 6-43, and three of the big six, the 6-63. Price reductions were announced at the same time. President A. P. Kemp, in discussing the price change said: "We have enjoyed one of the best six months in the twenty-three years of Auburn history. We have engineered improvements into the 1924 Auburns that are tried and seasoned, that improve the already remarkable performance of the Auburn motor car. We have increased factory efficiency and cut operating costs. At the old prices we felt that Auburn was a remarkable buy. Now the same and better Auburn is available at a price that is most extraordinary for such a car."

M. A. M. A. Program Devoted to Widening Automotive Market

Topics Include "How to Sell More and Lose Less," and "Promoting Sales Through Jobbers"

NEW YORK, Aug. 25—Members of the Motor and Accessory Manufacturers Association have received from J. M. McComb, chairman of the general program committee, the tentative program for the fall convention of the M. A. M. A., which is to be held at the Copley-Plaza Hotel, Boston, Sept. 19-22.

The convention theme is to be "Widening the Market for Automotive Products," and with this idea in mind Chairman McComb has arranged his card as follows:

Wednesday, 2 p. m., Sept. 19. Opening of the convention by President W. O. Rutherford. Address of welcome by James M. Curley, mayor of Boston. Report of General Manager M. L. Heminway. Speakers as follows: "Building More and Better Roads," Roy D. Chapin, chairman Hudson Motor Car Co., Detroit; "Providing Ample Space to Drive and Park Cars in Our Cities," Dr. John A. Harriss, deputy police commissioner, New York City; "Reducing Maintenance Costs and Increasing Service Efficiency," speaker to be announced; "Removing Unfair Automotive Taxes," Harry Meixell, secretary Motor Vehicle Conference Committee, New York City.

Wednesday, 8 p. m., Sept. 19. Speakers on "Widening the Market for Automotive Products by Developing Jobber Distribution," will be: "The Advantages of Selling Both the Jobber and the Dealer," E. P. Chalfant, chairman Gill Manufacturing Co., Chicago; "Promoting Sales Through Jobbers," Ray W. Sherman, business counsel the Class Journal Co., New York City; "Why We Sell Through Exclusive Territorial Distributors Only," speaker to be announced.

Thursday, 10 a. m., Sept. 20. "How to Sell More and Lose Less" will be the topic. Speakers and subjects: "Credit-Granting Problems in Selling the Jobber," speaker to be announced; "Fact Versus Opinion in Determining Credit Enlargements," speaker to be announced; "When to Call a Meeting of Creditors," O. W. Meyers, district credit manager Goodyear Tire & Rubber Co.; "How to Proceed in the Event of Bankruptcies and Receiverships," Sidney S. Meyers, general counsel Motor and Accessory Manufacturers Association.

Thursday, 2 p. m., Sept. 20. "Delivering the Goods" will be the topic. Speakers and subjects: "How the Railroads Are Preparing to Move the Product of the Automotive Industry," Gerrit Fort, vice-president, Boston & Maine Railroad; "The Shipper's Idea of Adequate Railroad Service," W. H. Chandler, traffic manager Boston Chamber of Commerce and ex-president National Industrial Traffic Managers' League; "Shippers' Distribution Problems," W. M. Twohig, traffic manager Willard Storage Battery Co., or M. J. Fitzgerald, general traffic manager General Electric Co., Schenectady, N. Y.; "Classification Problems Affecting the Parts Manufacturers," speaker to be announced.

Thursday, 6 p. m., Sept. 20. Boat trip, shore dinner and dance, Pemberton Inn, Nantasket Beach.

Friday, 10 a. m., Sept. 21. "Selling the World American Motor Transportation" will be the theme. Speakers and subjects: "A First-Hand View of the European Situation and Overseas Markets," John F. Kelly, Jr., export manager Electric Storage Battery Co., Philadelphia; "Putting Over the Message of American Quality and American Service," F. E. Titus, sales manager International B. F. Goodrich Co.,

Akron, O.; "How the Smaller Manufacturer Can Get Foreign Business," S. W. Dorman, vice-president and general manager Overseas Motor Service Corp., New York, and chairman M. & A. M. A. Foreign Trade Committee.

Friday, 2 p. m., Sept. 21. "How Advertising Can Help Sell More Automotive Products," will be the theme. Speakers and subjects: "Are We Properly Meeting the Need for Improved Traffic Conditions," H. W. Slauson, engineering service manager, Kelly-Springfield Tire Co., New York; "How Better Brake Equipment Can Sell More Cars," speaker to be announced. "How the Advertising of the M. & A. M. A. Members Can Help the National Automobile Shows," Samuel A. Miles, manager of the New York and Chicago shows.

Saturday, Sept. 22. Golf tournament at Country Club.

Georgia Legislature Lets Well Enough Alone

ATLANTA, Ga., Aug. 25.—The Georgia State Legislature, which had been in annual session in Atlanta the past two months, adjourned in mid-August without passing a single bill of any real importance that would have any serious effect on the automobile industry in the state. About 20 bills affecting the industry were introduced, of which half a dozen, if passed, would have shouldered the automotive industry in the state with an excessive burden of taxation. Due, however, to the efforts of the legislative committee of the Atlanta Automobile Association, no bill of importance affecting the industry was passed.

THE LAW AND SAFETY

CHICAGO, Aug. 25.—Drastic measures are now being employed in Chicago to check the death rate due to accidents to or caused by automobiles. Policemen have strict orders from the Chief of Police to arrest all persons driving recklessly or with too much speed. The courts have ordered that persons so arrested must be taken to a police station and held until they furnish bail. Heretofore the practice was to hand them arrest slips, a form of summons which many ignored with impunity. Persons found guilty of driving while intoxicated are now being sentenced to jail, in addition to heavy fines. The Coroner's records show 429 deaths to date this year as a result of accidents to or caused by automobiles.

SHOW MANAGERS TO MEET

BUFFALO, N. Y., Aug. 28.—The fall meeting of the National Association of Automobile Show and Association Managers will be held here at the New Statler Hotel, Sept. 7 and 8. The first day's program will include discussion of show promotion, with an exhibit of promotion material used in connection with recent shows.

The second day's program will include discussion of fall shows, co-operation in staging outlying shows, traffic and used cars,

Racine C. of C. Seeks to Interest Mitchell Bidders

Wisconsin Starts Campaign to Put Big Mitchell Plant Again Into Operation

RACINE, Wis., Aug. 27.—Recognizing the importance of rehabilitating the industry to the future welfare of Racine, second city in Wisconsin, the Racine Association of Commerce has entered an active campaign to interest prospective purchasers of the property of the defunct Mitchell Motors Co., for which informal bids are being received by Herbert F. Johnson, trustee, pending the formal auction to be held at the plant on Sept. 12.

Information regarding the availability of the necessary skilled craftsmen to man the plant has been gathered and submitted to a large number of concerns in addition to several which are understood to be making overtures to the trustees for the purchase of the property intact. The Racine Manufacturers' Association and the local federation of labor are co-operating in the effort and assisted materially in furnishing complete statistics concerning the labor supply.

The Mitchell plant has always been one of the largest industries of Racine, since the days of the establishment of the Mitchell-Lewis Wagon Co. in 1837. The present factory, covering 35 acres, with nine modern main buildings containing 604,800 sq. ft., is regarded as one of the best-equipped in the country for the manufacture of motor cars. According to F. H. Bartlett, executive director of the Racine Association of Commerce, there is much confidence that its invitation and attractive inducements will result in the transfer of the property in bulk, insuring a market for between 1,500 and 2,000 workmen comprising the normal force, most of whom have families and own their own homes.

CHANGES LICENSE PLATE SYSTEM

HARTFORD, Conn., Aug. 25.—In order to effect a reduction in the size of 1924 license plates and at the same time meet the demand of car-owners for lower numbers, state officials here have adopted a serial system of numbering. Licenses will be issued from branch offices throughout the states as well as at the capitol and a serial letter will be allotted to each division. To New Haven will be assigned the A series up to 9999, also the E series up to 9999; Bridgeport, F and H up to 9999; Waterbury K and New London N. The S series up to 9999 will be kept in reserve and sent to the first branch office that runs out of markers. The plates issued from the main office in Hartford will bear no prefix letter and will run from 1 to 99,999.

A special set of numbers has been reserved for the state highway department and also for the national guard; U-1 to U-200 will be issued to hearses and another set, B-1 to B-200, will be assigned to camp trailers.

Milwaukee Vocational School Has Automotive Department

**E. G. Glenn Appointed Head of the
New Department Devoted
to Automobiles**

MILWAUKEE, WIS., Aug. 27—One of the most notable developments that has ever been brought about in vocational education in this country is the establishment of an automotive department in the Milwaukee Vocational School, said to be the largest and most elaborate institution of its kind, being housed in a new seven-story fireproof building covering the larger part of a solid block at Sixth, Seventh, State and Prairie Streets. The first unit was completed in 1921 and the second was finished May 1, and is now being equipped.

E. G. Glenn has been appointed director of the new automotive department and is working out a system whereby young men of Milwaukee with a desire to become automotive mechanics may obtain practical experience and pay while going to school at public expense. He has concluded negotiations with 62 garages and service stations in Milwaukee to co-operate by furnishing the means of prac-

tical work. The pupils will be given the opportunity to get half-time employment, going to school one week and working the next. The course requires one year's time, and at its completion the pupil will be given three months of full-time work for his employer, then being eligible to take an examination for an authorized mechanic's certificate.

In addition to the complete course in automotive engineering provided by the school, and practical work in shops, the Vocational Institute is also organizing a complete, model service station where car owners will have available service at nominal cost. The work will be done by students under the supervision of the faculty, with close inspection throughout.

The Wisconsin Automotive Electrical Association is co-operating with Director Glenn and has signified its willingness to absorb virtually all of the finished material the school can turn out, as well as assisting by employing the pupils for part-time work while taking the course.

ASK FOR ACCOUNTING

WASHINGTON, Aug. 28—The United Automobile Association, organized during the past six months for the purpose of lowering the expenses of automobiling, has been asked for an accounting of its funds, by two holders of 300 shares each of the total 700 shares of stock.

Murphy's Trip to Europe Costs Him Racing Points

**A. A. A. Eliminates Him From
Championship Standing Because
He Won't Appear at Altoona**

NEW YORK, Aug. 27—Jimmy Murphy, American champion race driver, has lost his chance of retaining his title this year because of his European invasion, although when he sailed two weeks ago he had a clear lead over his closest rival, Eddie Hearne, and apparently was a sure winner of the 1923 championship. Murphy's credit of 1070 points was wiped out by the Contest Board of the American Automobile Association, which met for the first time under the direction of the new chairman, Joseph Mack of Detroit, under the rule which requires the five leaders in the championship contest to appear at all championship meets.

By leaving in middle of the racing season to drive a Miller Special for Count Zborowski in the speedway meet at Milan, Sept. 9, Murphy will be unable to drive at Altoona, Pa., on Sept. 3, at Fresno, Cal., on Sept. 29 and Kansas City on Oct. 17 as required by the rules, although he will be back in time for the Thanksgiving Day race at Los Angeles.

The Contest Board ruled that when Murphy went to France two years ago, where he won the French Grand Prix, he went as a representative of America, being on the team selected by the A. A. A., whereas on the present trip he is driving for a European sportsman. His absence from American competition is felt to be a serious blow to American promoters who thus lose their star attraction.

Counting Murphy out in this manner, makes Eddie Hearne leader in the title battle with 802 points, with Tommy Milton, who won the Indianapolis race in an H. C. S. Special this year, second with 800. Harry Hartz is third with 520, Benny Hill fourth with 350 and Earl Cooper fifth with 310.

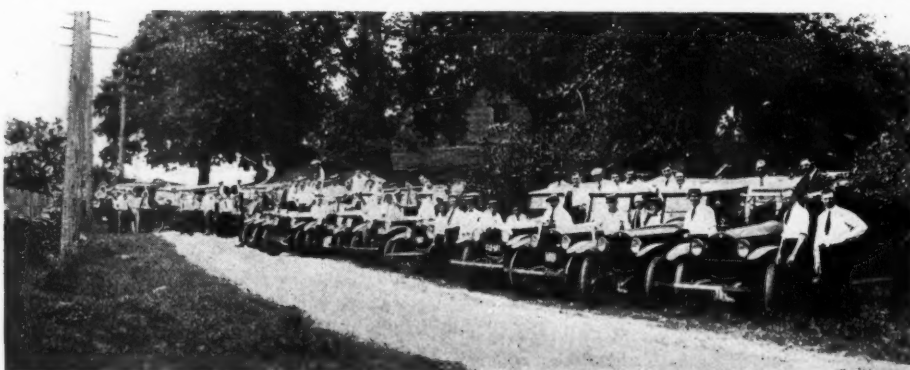
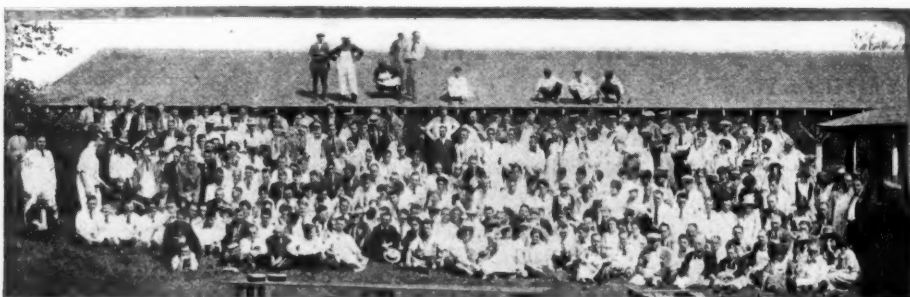
MOON HONORS DISTRIBUTOR

ST. LOUIS, Aug. 25.—The Moon Motor Car Co. gave a dinner here recently in honor of John H. Quinlan, president of Quinlan Motor Co. of Chicago, Moon distributor. This dinner was given as a tribute to Quinlan's record in building up his company until it is the largest distributor of Moon cars. Stewart McDonald, president of the Moon company, made a short talk and on behalf of himself and his associates presented Quinlan with a silver service set.

BUY TIRES WITH DIVIDENDS

KENT, O., Aug. 25—Plan to make customers out of its stockholders has been adopted by the Mason Tire & Rubber Co. which is paying its dividends in scrip. Stockholders can go to Mason dealers and buy tires with this scrip and in turn the dealers can pay the Mason company for their tires with this same scrip.

A Little Fun Helps Their Business



Fun was the watchword of two groups of automobile dealers and their friends in New England, who enjoyed outings the past week. The upper photograph shows the associate dealers, employes and guests of Harrington Hudson Co., of Hartford, Conn., and J. S. Harrington, Inc., of Springfield, Mass., on their annual outing at Riverside Park, Agawam, Mass. D. A. Harrington is head of the Hartford concern and his brother, J. S. Harrington, is in charge of the Springfield firm. The two organizations control the distribution of Hudson and Essex in Connecticut and southwestern Massachusetts.

The lower photograph shows dealers as guests of the L. & H. Motor Co., Hupmobile distributor at Hartford, Conn., on their annual outing at Gardner's Lake, Norwich, Conn. A feature of this outing was clam chowder served by C. V. Pendleton, the Norwich Hup dealer. The new Hupmobile models were displayed at this outing.

Outdoor Show Stimulates Sales for Denver Dealers

Thousands View Latest Models Exhibited in Beautiful Setting of Civic Center

DENVER, Aug. 25.—Automotive activities in the Rocky Mountain territory received a substantial stimulant last week from Denver's Third Annual Mid-Summer Automotive Show, staged jointly by the Denver Automobile Dealers' Association and the Denver Post at the city's widely known Civic Center. In spite of rain two afternoons and three evenings out of the three days and four nights devoted to this unique open-air event, the attendance suggested that plenty of people were eager to take advantage of every hour of favorable weather that interrupted this exceptionally rainy season, while sales reported by a dozen or more dealers indicate that there was a goodly percentage of business interest among the show visitors.

There were 80 cars shown by 42 dealers, elaborate exhibits by three motorcycle dealers and five model motor camps staged by manufacturers and distributors of tents, cots and other camp furniture and all sorts of accessories for motor campers and tourists. Between closing and opening hours of the show the cars were kept covered with canvas. This arrangement, along with the camping features, gave the appearance of a tent city during those hours—and also during several additional hours when the rain poured out its protest against Denver's long established reputation for exceptionally dry Augusts.

In addition to the benefit of resulting sales, President J. L. Craig of the dealers' association, who was also chairman of the exhibit committee, points out that the show provided an excellent opportunity for the tradesmen to show the public what the automotive industry amounts to in Denver.

There were entertainment including band concerts, troupes of singers, instrumental musicians and vaudeville entertainers, fireworks, a quoit pitching contest between teams of exhibitors using inner tubes for quoits, and a Boy Scouts' snowball battle staged with truck loads of eternal snow brought from Corona, the Moffat Railroad's far-famed "Top of the World" on the crest of the Continental Divide, 65 miles west of Denver. It is not surprising, therefore, that many of the show visitors were seeking mainly an afternoon or evening of frolic and festivities, especially at a time of year when Denver is host to so many tourists from all parts of the United States and from several foreign countries as well. Rather were the exhibitors surprised to meet as many customers and prospective customers among the crowds that came and went in carefree way without paying any admission and without being surrounded by the usual business atmosphere of a regulation automotive show.

Denver's Outdoor Show at Civic Center



AMERICAN BODY CORP. PLAN

PHILADELPHIA, Aug. 24.—Organization of the American Body Corp., in which Charles M. Schwab is interested, has been completed and it is announced that the Schwab policies will dominate the activities of the corporation. Rodney Day has been chosen president, Robert E. J. Corcoran, vice-president, John B. Kilburn, treasurer, and Henry E. Mead, secretary and assistant treasurer. Directors are Charles M. Schwab, F. S. Wheeler, Edward R. Tinker, Elisha Walker, Robert I. Barr, W. D. Baldwin, Rodney Day, E. M. Champion and H. L. Beyer.

The corporation owns and operates plants in Philadelphia and Detroit, having a combined floor space of approximately 1,500,000 square feet.

GAS TAX GOOD FOR \$13,000,000

PHILADELPHIA, Aug. 20.—Pennsylvania's emergency gasoline tax will produce approximately \$13,000,000 in the two-year period in which it will run and net the State's general fund \$9,750,000, or about \$3,000,000 more than estimated, if present sales keep up. The sum to be apportioned among the counties is estimated at \$3,250,000. The new tax adds one cent to the one-cent tax of 1921. Collections from Jan. 1 to June 30, amounted to \$1,572,578.

35 TRUCKS A DAY

SPRINGFIELD, O., Aug. 25.—Production of 35 light motor trucks a day is the schedule being maintained at the Springfield works of The International Harvester Co. Outlook for fall trade is bright, the representatives of the company say. Orders for trucks have been received from South America and Australia.

3 Peerless Branches Set New Sales Records in July

CLEVELAND, Aug. 27.—Eight branches of Peerless Motor Car Co. had sales in July aggregating nearly \$2,000,000. At three of the branches, Boston, Cleveland, and Washington, all previous monthly sales were surpassed. "This is especially significant," says D. A. Burke, vice-president in charge of Peerless branches, "because it comes on top of the fact that sales by our branches in June were greater than ever before."

In July however, the Cleveland branch surpassed its own best previous record by more than 30 per cent, Boston advanced its best previous mark by a similar margin and Washington outstripped its best previous month by more than 20 per cent. Sales of used cars for July throughout the Peerless branches were the largest in Peerless history.

TO MAKE TRUCK BODIES

TOLEDO, Aug. 24.—The Martin-Parry Co., manufacturer of standardized commercial bodies, will open a factory branch here in a portion of the old Milburn Wagon Co. plant on Monroe street, it was announced this week. The plant has been leased from the General Motors Corporation which purchased it from the Milburn company a few months ago. E. Ainsley, of the Detroit factory branch, will come to Toledo as manager of the new branch.

It is believed that the plant here will adequately handle all of the Willys-Overland business in its line. The Overland company has equipped a number of its stock chassis with Martin-Parry bodies for many years and the new factory branch will enable owners to drive away the completed cars from Toledo.

1000 Members, Iowa Dealers' Goal

Enrollment Now Higher Than Ever, Says Secretary Knapp

State Association Benefits Result in Almost 100 Per Cent Renewals

DES MOINES, Ia., Aug. 25.—According to A. J. Knapp, secretary-manager of the Iowa Automotive Merchants' Association, the Iowa organization is flourishing. More members than ever before in the history of the organization are now enrolled. Few of the old members are refusing to renew and Knapp estimates the loss in members from this source at less than one-quarter of one per cent. New members are being given membership certificates each day and the total aimed at for Dec. 1 is a membership of 1,000. This total seems assured at the present rate of growth.

The Bulletin, official organ of the association, has kept pace in growth with the membership. A twenty-eight page publication is now being printed each month and distributed to automotive dealers of the state. A section of news, special articles and editorials by Knapp make up the content of the Bulletin. Advertising makes the publication more than self-supporting.

Finance Firm Contracts for Ford Time Sales in Canada

MONTREAL, Canada, Aug. 25.—An arrangement has been completed with the Ford Motor Co. of Canada, Limited, and the Traders' Finance Corporation (Canada), Limited, whereby the latter company will handle the entire wholesale and retail acceptances of the Ford Motor dealers throughout the whole of Canada and thus establish a uniform charge to the public on Ford products sold on the deferred payment plan. Previous to this arrangement the public was paying various charges to numerous companies. This new company will effect an average saving of 15 per cent to car purchasers, it is claimed.

The company anticipates the volume of business that will be handled this year on this one project alone in the vicinity of \$30,000,000.

The Traders' Finance Corporation, Limited, which is probably the largest Canadian company of this nature, was originally formed in Winnipeg, and has a paid-up capital of \$2,250,000.

PITTSBURGH FALL SHOW

PITTSBURGH, Pa., Aug. 27.—The annual fall automobile show in Pittsburgh will be held in Motor Square Garden Sept. 22 to 29, General Manager John J. Bell has announced. Final arrangements with the Automotive Association have been concluded.

While the show this year is to be held earlier than heretofore, officials of the

association declare they have found a tendency among automobile manufacturers to announce earlier than usual their 1924 models, thus making an earlier date possible and at a time when thoughts of motor car owners are naturally concentrated on new models.

Danger in Spark From Filling Gasoline Tank

NEW YORK, Aug. 27.—Recognition of the dangers of static electricity generated during the filling of gasoline tanks is taken by the National Board of Fire Underwriters, whose general manager, W. E. Mallalieu, has issued the following warning:

"While flowing through hose such as is customarily used by filling stations and supply trucks, gasoline generates static electricity from friction incident to its passage. The electrical charge in the hose attempts to escape and in doing so will jump a fair sized gap to the nearest metal surface, thus creating a spark.

"Recently a number of people have lost their lives and others have been badly burned while seated in automobiles whose gasoline supply was being replenished, because, in each case, such static sparks have ignited the gasoline vapor escaping at the mouth of the tank; in several instances explosions have followed.

"Tragedies of this kind may be easily avoided, however, by making sure that the nozzle of the hose is in continuous contact with the unpainted metal mouth of the tank. When this practice is followed the static charges are harmlessly equalized. With tank trucks, the additional precaution of a grounding chain should always be employed."

OVERLAND USES LARGER ENGINE

TOLEDO, Aug. 25.—Indications are that the trade has readily accepted the reductions made effective last week in the Willys-Knight prices and the improvements noted in the Overland Four.

The Overland Four will now be equipped with a larger and more powerful engine—the same which has been so well received in the "Redbird" model. It has a bore of 3½ inches by stroke of 4 inches as compared with bore 3¾ and stroke 4 inches of the former engine. This materially increases the horsepower.

WESTCOTT PRODUCTION INCREASES

SPRINGFIELD, O., Aug. 25.—Production of Westcott cars has been increased to meet the demands of the trade, officers of The Westcott Motor Car Co. state. Reduction in the price of the cars caused considerable activity during the last two weeks. August business will be almost up to May and June which were record months.

Cleveland Dealers Adopt Certified Used Car Plan

14 Association Members Unite in Plan First Tried at Used Car Show

CLEVELAND, Aug. 25.—A group of members of the Cleveland Automobile Manufacturers and Dealers' Association will undertake, beginning Sept. 1, a new plan of used car co-operation. The plan calls for co-operative inspection and advertising of used cars to be merchandised by these dealers. Fourteen members of the association, representing several of the more popular cars, are now in the plan and others may join when operations begin.

The plan is an outgrowth of the recent used car show, in which dealers were permitted to exhibit only those cars which came up to a definite reconditioned standard. The cars were inspected by a used car expert, working under the authority of the show committee. The inspector who did the work for the show has been engaged by the present co-operating group of dealers and will open a garage to which dealers will bring cars as candidates for certification and co-operative advertising. If a car passes the test, a "Tested and Approved" seal will be placed upon it and it will be included in the list of cars being advertised by the association. If a car does not pass the test, the dealer either has to take it back to his shop and bring it up to standard on a later inspection, or sell it without certification.

It is intended to take newspaper advertising space of varying size, some of which will be institutional in nature, intended to win public recognition of the certification idea, while other advertising will contain lists of tested and approved cars with their numbers and the name and address of the dealer at whose establishment they are on sale.

The plan will be inaugurated with a charge of \$20 a car for inspection, a cost which it is hoped will be lowered after the bureau has been operating for some time. It is expected that in addition to setting up a standard of used car values the co-operative advertising idea will also reduce used car advertising costs of the individual dealers.

The bureau will not have anything to do with fixing allowances or retail prices.

HEAR PELLETIER TALK

ST. LOUIS, Aug. 23.—Members of the automobile trade in St. Louis, both dealers and manufacturers, heard E. Le Roy Pelletier of the Rickenbacker Co., Detroit, in his address at the Statler Hotel last week before the advertising Club of St. Louis. Robert E. Lee, secretary of the St. Louis Automobile Dealers' Association, introduced Pelletier.

BUSINESS NOTES

The Pennsylvania Rubber Co. of Jeannette, Pa., gave its twentieth annual outing for its employees Aug. 18 at Oakford Park.

H. B. Harrison, president of the Harrison Radiator Corp. of Lockport, N. Y., has announced that a \$500,000 contract has been let for erection of a building to be used for the manufacture of automobile radiators for the General Motors Corp.

The Perfection Battery & Light Co. of Atlanta is a Georgia corporation and did not move from Chicago to Atlanta, as stated in a recent issue of *MOTOR AGE*. It has no connection with a Chicago company of similar name.

General Accessories Co. of Pontiac, Mich., recently organized by Frank Briscoe, has opened its Detroit sales and financial office in the Book building. The sales are under the charge of James Holihan, who was for years connected with Briscoe in the Briscoe Manufacturing Co. The financial department is in charge of Sid Essrig, formerly connected with the Durant activities.

The Peterson & Egeland Mfg. Co. of Sturgeon Bay, Wis., has been incorporated with an initial capitalization of \$5,000 to engage in the quantity production and merchandising of the Peterson engine stand, a new fixture designed by George Peterson, Ford dealer at Sturgeon Bay, for shop use.

Chicago Trade Gives Outing for Orphans and Homeless Aged

CHICAGO, Aug. 25.—Orphans and the homeless aged, who are wards of various institutions in Chicago, were treated to their annual outing in Lincoln Park last week as guests of the Chicago Automobile Trade Association. For many years the trade association has made it its special obligation to see that automobiles and money are supplied to provide the city's homeless dependents with a day of genuine enjoyment.

Members of the association furnished many cars themselves and obtained the use of those of many owners for the day. In all between 400 and 500 cars were required. Funds were contributed liberally by the association members to provide food, refreshment, toys and entertainment for the guests.

DAYTON RUBBER REPORT

DAYTON, O., Aug. 24.—The consolidated balance sheet of the Dayton Rubber Manufacturing Co. as of June 30 shows current assets of \$2,058,227, made up of \$182,124 cash on hand and on deposit; \$721,615 accounts receivable; \$104,909 notes and acceptances receivable; \$7625 accounts payable; \$695 accrued interest receivable, and \$1,041,257 inventories. Land, buildings and equipment are valued at \$1,565,597, while intangible assets, like patents, good will and reorganization expense, are given as \$1,357,056.

Current liabilities include \$52,142 trade accounts payable; \$74,716 other accounts payable; \$721,000 notes payable, bank and personal; \$259,993 acceptances payable. Capital accounts outstanding total \$3,921,146.

HARRIS & RODGERS CHANGES

CHICAGO, Aug. 25.—Harris & Rodgers, used cars dealers in Chicago for many years, specializing in the highest grades of cars, are going out of the specialized used car business. The Harris &

The United States Electrical Tool Co. has moved its Detroit district office from the Marquette building to 50 Canfield avenue E., and also its Columbus office from 430 N. High street to 509 N. Park avenue. At both of the new locations a large stock of tools will be carried to insure prompt shipment of orders and also a well equipped service station, with a complete stock of parts.

Formal transfer of the plant, equipment and business of the defunct United States Gear Shift Co. of Eau Claire, Wis., to B. R. L'Honmedieu and associates of Madison, Wis., who bid in the property for \$41,500 some time ago, has just been made by order of the referee in bankruptcy. The new owners have been making a survey to determine the extent of the capacity to be used for continuing the manufacture of the hydraulic gearshifting device.

The Carbon Engineering Co. of Milwaukee has been incorporated in Wisconsin with \$20,000 capital to engage in the manufacture of carbon brushes and other similar carbon products for the automotive and electrical industries.

The announcement has just been made that Hassler friction-type shock absorbers are now available for Cole, Packard, Hudson, Essex, Lincoln and Chevrolet cars.

Rodgers company owns the Stutz Chicago Co. and for more than a year has been engaged in the retail and wholesale distribution of the Stutz. The used car store is being given up in order that the company may devote itself exclusively to the Stutz business.

BATES OUT OF STERLING TIRE

NEW YORK, Aug. 25.—Charles Austin Bates has disposed of the controlling interest he had in the Sterling Tire Corp. of Rutherford, N. J., which he organized in 1908, and has withdrawn entirely from the management of the concern which now is under the direction of A. A. Alt-schuler, who has been president since 1919. Directors of the Sterling company are: J. M. Rector, Walter Little, Frank A. Ball, F. J. Schwarz and Herbert R. Welch. The company reports that in 1922 it produced 244,000 tires, which it sold for \$2,707,257, with operating profits in excess of \$250,000.

ROAD PROGRESS IN MISSOURI

ST. LOUIS, Aug. 23.—F. W. A. Vesper, formerly president of N. A. D. A., spoke at a mass meeting of St. Louis County citizens last week when plans were discussed for the hard surfacing of the Ozark Trail from St. Louis to Pacific, Mo. It is expected this step will be taken shortly.

There is at the present time \$30,000,000 worth of road under construction in Missouri under provisions of the bond issue of \$60,000,000 voted for good roads. In addition to the minor improvements being made under the old law which provided a small tax for the purpose.

SHOW AT MEMPHIS FAIR

MEMPHIS, Tenn., Aug. 25.—The Sixteenth Annual Tri-State Fair at Memphis Sept. 22 to 29 will be featured by automobile races and an automobile show. The Memphis Automobile Dealers' Association, Thos. Smart, president, and Thos. B. King, secretary, is co-operating in every way. The Fair takes place the last week in September.

122 Cu. In. Cars Groomed for Good Showing at Kansas City

Duesenbergs, H. C. S. Specials and Millers Will Compete in 250 Mile Event

KANSAS CITY, Aug. 27.—The 250-mile national championship motor races on the Kansas City speedway October 17 are expected to provide the ultimate opportunity for real results from the 122-inch piston displacement, one-man cars. These cars are said to have produced two sorts of surprises here July 4—one being the speed they made, and the other, the inability of oiling systems to care for the possible speed.

A good many of the fastest cars dropped out of the Independence day event early, because of breakdown of the oiling systems, and the burning out of bearings. But the drivers found out that they could make speed in them—and they are working now to correct the defects that caused the withdrawals of so many of them during the race.

Several Drivers at Kansas City

Several of the drivers are working on their cars at Kansas City, and after making changes, and adjustments, trying them out on the speedway. Harlan Fengler has made 123 miles an hour in his Wade Special this month, and seems confident that he can keep going at high speed. Harry Hartz and Eddie Hearn, with Fred Comer, manager of the Durant team, have seemingly discovered ways to help out the oiling problem, and they have made 115 to 120 miles an hour on the track here. Tommy Milton and Earl Cooper are working in Indianapolis on their cars, and the Duesenberg group is also working at Indianapolis.

Two Races Before Oct. 17

The dopesters point to the fact that the 122-inch cars will have a 200-mile tryout at Altoona on Labor day, and after a chance to work on improvements that may be suggested by that experience, they will have the benefit of the Fresno races on Sept. 29, before coming to Kansas City Oct. 17. The drivers are confident that Kansas City therefore will show the final consummation of performance in high speed and persistence, for the 250 mile race.

Following are the entries so far made for the Kansas City Speedway race:

Three Duesenbergs, with Bennett Hill and two drivers not yet named.

Two H. C. S., with Tommy Milton and Earl Cooper.

Elliott Special, with Frank Elliott.

Duray Special, with Leon Duray.

Wade Special, with Harlan Fengler.

Mercedes Special, driver not yet named.

Durant Special, with Jerry Wonderlich.

Prizes so far announced total \$25,000. The first prize is \$9,000 and the second is \$4,500. The tenth prize is \$500 and there is a guarantee fund of \$2,500.

CONCERNING MEN YOU KNOW

Jack Kirk, salesman for the Thermoid Rubber Co. for the last 14 years, has joined the sales force of the Amco Mfg. Co. of Indianapolis. He will have charge of Amco's New York office, which will be opened in September. He will cover the territory in and about New York City and he will handle New England sales.

R. S. McLaughlin, president of General Motors, Ltd., of Canada; R. D. Kerby, sales manager; W. H. Moyse, chief engineer, and W. J. Davidson, technical engineer, all of Olds Motor Works of Canada, Ltd.; and T. G. Breen, president of Breen Motor Car Co., Ltd., Winnipeg Oldsmobile distributor, were visitors at the Oldsmobile factory last week.

M. L. Corson has been appointed special sales representative for the Apperson Bros. Automobile Co., with headquarters in Philadelphia. He was formerly branch manager for Apperson in Philadelphia.

J. E. Gibbons has been appointed territorial representative for the Apperson Bros. Automobile Co. in Western Pennsylvania, West Virginia and part of Ohio. Gibbons was for years wholesale manager for Haynes in the Pittsburgh territory and just recently branch manager for Apperson in Pittsburgh.

John T. Powell, formerly branch manager in Baltimore for the Apperson Bros. Automobile Co., has been promoted to Southeastern representative with headquarters in the Garrett building, Baltimore. Powell will have charge of all dealer accounts in Virginia, West Virginia, North and South Carolina and Georgia.

Phillip H. Brockman, president of the De Luxe Automobile Co., St. Louis Oldsmobile distributor, is recovering from an illness bordering on a nervous breakdown brought about by overwork. Brockman is president of the St. Louis Police Board and his efforts in behalf of the force have not permitted him to get proper rest.

Simon Ott, 53 years old, who did an extensive automobile business at Beemont, Mo., died at his home there recently after a short illness.

Earl G. Gunn, chief engineer of the Lafayette Motors Co., has sailed for Europe, where he will investigate foreign engineering practice.

J. Edward Dunn Company has succeeded G. B. G. & Mfg. Co. as manufacturers of the G. B. line of valve tools, reamers and other automotive tools and parts.

L. L. Hardin, treasurer of the Anderson Motor Company at Rock Hill, S. C., has resigned, effective Sept. 1, to become associated with the Hawthorne and Hampshire mills at Clover, S. C.

Lou H. Clampit, district representative of the Yates Rubber Co. in the Central States territory,

has been transferred to the Southwest territory, with headquarters at Dallas. He is succeeded by L. C. Anthony, formerly of the Clymer Manufacturing Co., while F. J. Cavender will cover the Central States.

J. H. O'Brien, who joined the Apperson Bros. Automobile Co. in May of this year as assistant to N. H. VanSicklen, vice-president and general manager, has been appointed factory manager. O'Brien takes charge at a time when production on the new Apperson is being greatly increased to take care of the enlargements in the dealer organization.

Three new district sales managers and several branch managers have been appointed by the General Motors Truck Company, according to an announcement by V. A. Day, general sales manager. R. A. Sweet, who has been manager of the Indianapolis branch, has been named district sales manager of the Northwest territory. He will be succeeded in Indianapolis by J. Z. Perrin, who has been assistant manager. J. W. David, manager of the St. Louis branch, has been named district sales manager of the southern territory. George M. Howard of Philadelphia, who has been with the St. Louis branch for some time, has been named branch manager, to succeed David. E. J. Kilborn, manager of the Chicago branch, has also been appointed district sales manager for the middle western states and will continue as manager of the Chicago branch.

E. G. Christensen, sales manager of the Carl Pick Co. of West Bend, Wis., manufacturer of universal joints and propeller shafts, has been promoted to the office of vice-president. He will maintain his Chicago office at 732 Sherman street.

William Troescher, formerly manager of the Premier Motor Sales Co. of Cincinnati, has recently been appointed assistant sales manager of the Premier factory at Indianapolis. The Premier Motor Sales Co. of Cincinnati has been made a factory branch with Floyd S. Prothero as general manager.

E. J. Filiatrault has been promoted from assistant to purchasing agent of the Chandler Motor Car Co. to fill the vacancy caused by the death of Roy McCormick Fraser, who died recently after seven years service with the Chandler company.

Francis B. Davis, Jr., has succeeded R. R. M. Carpenter as general manager of the pyralin department of E. I. du Pont de Nemours & Co. Davis is a former du Pont man who was transferred to the General Motors Corp. and called back to become Carpenter's assistant. R. W. Brokaw has been advanced to the position of assistant general manager, made vacant by Davis' promotion.

Detroit Automobile Men in Southern Finance Firm

DETROIT, Aug. 26.—A number of automobile men of this city are interested in the American Finance & Mortgage Co., just organized in Savannah, Ga., and capitalized at \$1,000,000. Lewis H. Smith of Savannah, is president; Howard E. Coffin, vice president of the Hudson Motor Car Co., is vice president; H. P. Hodkins of Savannah, secretary-treasurer, and C. S. Anderson of Detroit, assistant secretary-treasurer. The members of the board of directors are: Ford B. Lantyne, secretary, Michigan Alkali Co., Wyandotte; Howard E. Coffin; Eugene W. Lewis, president, Industrial Morris Plan Bank, Detroit; Harry M. Jewett, president, Paige-Detroit Motor Car Co., Detroit; Alvin Macauley, president, Packard Motor Car Co., Detroit; H. N. Torrey, physician, Detroit; P. W. A. Fitzsimmons, president, Michigan Mutual Liability Co., Detroit; Clement O. Emory, New York, and Charles A. Bond, Cleveland.

OVERLAND DEALERS PICNIC

OTTAWA, Ill., Aug. 24.—Eight hundred Overland dealers from Illinois, Indiana and Iowa, held a barbecue and picnic at Ryan's grove near Starved Rock Aug. 10.

A tug-of-war with 200 men on a side was a feature, the down-state group defeating the Chicago dealers. Irving Metcalf, Galesburg dealer, won the prize at the barbecue, out-eating all competitors. The down-staters won in a baseball contest with Chicago dealers.

OHIO CONVENTION

COLUMBUS, O., Aug. 25.—Charles B. Rattermann, president of the Ohio Automotive Trade Association, announces that the annual convention of the organization will be held in Columbus Dec. 5-6 at the Hotel Deshler. The convention committee consists of E. C. Brisley, Packard-Columbus Motor Co., of Columbus, chairman; Warren E. Griffith, Landman-Griffith Co., of Toledo, and C. A. Dunham, Ohio-Buick Co., of Cleveland.

TO USE CHRISTMAS PACKAGES

CHICAGO, Aug. 24.—The Automotive Equipment Association, in its current bulletin, names 28 manufacturing members of the association who have notified the merchandising department of their intention to pack their merchandise in Christmas packages for the holiday trade. Several more are expected to follow this plan, the bulletin states.

Bill Would Bar Automobiles From Boston Business Area

"No Parking" Signs May Be Hung Up in All of Business Section at Certain Hours

BOSTON, Aug. 25.—Will motor cars be barred entirely out of the business section of Boston eventually?

That is what some of the motor car owners are asking now as a result of a hearing before the Board of Street Commissioners this week. At the meeting the Commission had a tentative plan for barring all parking whatever between the hours of 7 and 10 in the morning and 4 and 7 in the afternoon. That would allow cars to be driven in town and out again without stopping. It would interfere with transacting any business. The area proposed for this covers all the district between the waterfront and the Back Bay which includes the business, shopping, financial, most of the theatres and a number of hotels.

There were many in favor of putting on these restrictions, including the motor truck men, the latter's action being quite a surprise to the motorists, who for some years have been fighting the battles of the commercial vehicles owners before the legislature, thereby keeping them out of excess taxation and regulation by the Public Utilities Board. Retail shopping men opposed it, however. So did some of the motor owners, who felt it was the start of 100 per cent exclusion that has been talked of so much.

It may now result in some sort of a compromise between Mayor Curley and the motorists. The Mayor believes in a \$25,000,000 highway right through the heart of the city for teaming and to solve the motor traffic. To do this will necessitate borrowing the money outside the tax limit, and the legislature has to give permission. So he may request the motorists to aid him get this bill through next year. Financial and real estate owners object to this plan, however. Meanwhile the motor clubs and owners may let the truck men fight their own battles in the future before the legislature.

MOTORCYCLE RACES AT K. C.

KANSAS CITY, Aug. 25.—Motorcycle races to be held on the Kansas City Speedway on Labor day are proving a fruitful source of developing interest in the speedway over the western states. The motorcycle races are under M. & A. T. A. auspices, the 100-mile national championship having been allotted to Kansas City. There will be a 10-mile Kansas City Speedway championship, an annual event with a loving cup, and a 25-mile Australian pursuit race. A particular feature of interest is the amateur event for Missouri and Kansas riders, a 25-mile race, for one entrant only from any one town of the two states. It is now known that at least 50 towns will send contestants, these to be cut down to 25 by elimination tests at Kansas City, over the speedway, starting Aug. 27.

IN THE RETAIL FIELD

The Boyd Motors Co. of St. Joseph, Mo., distributor of the Star and Durant cars, has opened a branch at King Hill avenue and Cherokee in South street.

R. Ed. Gillespie, who has been connected with the automobile trade of Springfield, Mo., for more than eight years, has formed a new company that will be known as the Gillespie Motors and will be located in a large building at 463-65 St. Louis street. The new company will distribute Oldsmobile cars in Greene, Stone, Christian, Camden, Polk, Hickory, Webster, Dallas, Laclede, Wright and Douglas counties.

The Orrison-McArthur Garage of Marshall, Mo., has just remodeled an uptown building in that city for a modern garage, the new plant having all of the needed departments for carrying on a large business. The company has the agency for the Studebaker car for a radius of 50 miles from Marshall.

The Wills Sainte Claire Columbus Co., Columbus, O., has been chartered with a capital of \$10,000 to buy, sell and deal in automobiles, parts and accessories.

Dallas Utter, 1113 Cherry street, Toledo, O., has taken over the distribution of Lomar shock absorbers in Toledo and vicinity.

The Heinrich Automobile Co., 5123 Delmar boulevard, St. Louis, was named an Oldsmobile dealer last week by the DeLuxe Automobile Co. The Heinrich company has been in the automobile garage and repair business at the present location for almost 20 years.

Lakeside Motor Car Co., Milwaukee, has been incorporated for \$10,000 by W. S. Bieringer, 229 Oneida street; Henry Schostak and George E. Page, to engage in the general sales and service business.

The Purcell-Wischan Co., Madison, Wis., a pioneer dealer concern, has changed its name to Purcell-Bluteau Auto Co.

Joseph Schibilsky and A. H. Dahl, Plymouth, Wis., have incorporated the Schibilsky Motor Co. of that city, with \$5,000 capital.

After an absence of four years the Apperson has returned to Broadway. Apperson Motor Co., Inc., located in a handsome salesroom at 1930 Broadway, has been organized to represent this car in New York City and the Metropolitan District. E. C. Johnson, who was formerly branch manager for the Standard Motor Car Co. in New York City, and before this special sales representative for numerous other automobile manufacturers, is in charge of the new company.

H. A. Burgess, old time Southern California automobile man, has been named Northern California wholesale representative for the Apperson Motor Car Co., Pacific Coast distributors.

W. B. Sudduth has been appointed distributor of the Paige and Jewett cars at Bloomington, Ill., and has opened a sales agency at 307 South Main street, that city. He was formerly of Clinton, Ill.

The following have been appointed as new Cleveland dealers: Newmont Motors, Inc., Albany, N. Y.; High Street Garage, 198 High street, Bristol, R. I.; L. E. Gibson Motor Co., 102-104 Highland Park boulevard, Clarksburg, W. Va., and Withers Bros., Pike and Sycamore streets, Grafton, W. Va.

Phelps & Co., Hartford, Conn., Lovejoy shock absorber distributor, has given up its old quarters at 344 Pearl street, and removed to the former Wood garage on Ann street.

Trainor Bros. Motor Co., Madison, Wis., has been appointed Stearns-Knight dealer with headquarters at Regent and Monroe streets.

The King-Braeger Co., Milwaukee, capital stock \$50,000, has been incorporated by James B. King, Oscar H. Braeger and E. W. Genens, to deal in new and used motor vehicles, operate a garage and repairshop, deal in equipment, etc.

West End Auto Repair Co., 503 Regent street, Madison, Wis., has been appointed western Wisconsin distributor of the Witwer storage battery and in turn has named these associate dealers: National Buick Auto Co., Mt. Horeb; Boward Bros., Cross Plains, and Sun Prairie Auto Co.

Riegick Bros., proprietors of the Berlin (Wis.) Vulcanizing Co., and conducting a filling and service station, recently opened their new sales and service building for Star and Durant sales, across the street from the filling station. Every motorist within hailing distance was invited to get one gallon of gasoline free with every 5-gallon purchase. Exactly 1,880 gallons of gas were sold and 313 gallons given away. The number of owners who called for service on that day was

MARTIN GOES WITH AUBLE

CHICAGO, Aug. 25.—E. A. Martin, formerly with the H. C. S. factory, has been

403. In the evening there was a free dance in the new salesroom.

The Owen-Hill Motor Co. on August 18 announced the taking over the distribution in Little Rock, Ark., of the Packard line of motor cars formerly handled by the Rowe-Woolfolk Auto Company. The Owen-Hill Co. also handles the Hupmobile.

Guy L. Smith, automobile distributor in Omaha, who handled the products of the Hudson Motor Car Co. for 12 years, has recently changed from that line to Peerless, Jordan and Cleveland.

C. Russell Lee, Joseph A. Scholl, and Fred Reynold Voit have purchased the business and stock of the White Motor Sales Co., 1811 Jefferson avenue, Toledo, O., which was conducted for many years by Leo and Albert Ries.

Fred J. Hansen, Hartford, Conn., has severed his connection with Moken & Amidon, associate Hupmobile dealer, and has organized the Manchester Motor Sales Co., to handle the Hupmobile in the Manchester territory.

The Service Motor Car Co., Rock Island, Ill., has opened a branch sales room at 314 East Second street, Davenport, Iowa, with Julius Gottlieb in charge, representing the Star and Durant cars here.

Retailing of the Columbia in Boston has been taken over by the Boston Motors Corp., 890 Commonwealth avenue, and not by the Brown Motors Corp., as stated in a recent issue of MOTOR AGE. The Brown Motors Corp., acting exclusively as wholesale distributor of the Gray, occupies space upstairs in the building occupied by the Boston Motors Corp.

Charles W. Harris and Deloss D. Lain, Bloomington, Ill., as the Harris-Lain Buick Co., have opened a garage and salesroom at the Broadway garage. They have the Buick agency in the Bloomington territory.

Roy Baker has opened the Baker-Nash Auto Agency in Quincy, Ill., at 416-424 Vernon street. He will have the Adams, Pike and Brown counties territory for the Nash and is organizing the district for sub-dealers.

Clyde D. Eaton, Havana, Ill., dealer, has purchased the Prief & Hawks implement store property, and plans to erect a modern sales and service room for his Ford agency.

J. W. Baker, manager of the Acme Motor Truck Co., which has been located at Spring and Fourth streets, Columbus, Ohio, has secured larger quarters for the salesroom and service station at 171 South Front street.

Nelson Phyllis has leased the Gustafson building, Orion, Ill., and will establish a garage and salesroom. He has the agency for the Durant and Star cars.

The Al G. Faulkner Co., Inc., of San Francisco, has been appointed distributor for the Dorris car of St. Louis in northern California, according to announcement by Col. A. C. Lundy, western representative of the Dorris Motor Car Co. Faulkner, who is one of the best known automobile men on the coast, has made an enviable record with the Kissel, and is highly pleased at the addition of the Dorris to his line.

Charles M. Dorrel, Exide battery service man at Macon, Mo., has purchased the tire repair business of Harry I. Smith of that city and will consolidate the two.

The Butler-Kinney Motor Co. of Independence, Mo., has moved into its new quarters at 319-321 West Maple avenue in that city. The Phelps Motor Company, which formerly occupied the building, has temporary quarters at 204 North Liberty street.

H. T. Shogren, formerly with Packard and Cadillac in Milwaukee, and Chester F. Thomas, advertising expert, have formed the Shogren-Thomas Co. of Milwaukee to take over the retail sales and service of the Peerless, with headquarters at 517-521 Jefferson street, the home of the Redner Automobile Co., Wisconsin distributor.

The King Motor Sales Co. has been organized at Maywood, Ill., with capital stock of \$10,000. A garage and sales agency has been opened at 511-513 South Fifth avenue.

C. W. Harris and D. D. Lain have organized the Harris-Lain Buick Co. and opened a garage and sales and service station at 208 South Broadway, Normal, Ill., and will sell the Buick car.

Blackstone Smith and E. J. Dederer have organized the Kane County Auto Sales Company and opened a sales agency and service station at the corner of Lincoln avenue and New York street, Aurora, Ill. They will distribute the Durant and Star cars.

appointed retail sales manager of W. C. Auble Motor Co., Durant and Star distributor in Chicago.

1923 to Be Banner Year for Cleveland Motors, Says Black

Production This Year to Be 60 to 70 Per Cent Greater Than in 1922

CLEVELAND, Aug. 25.—The year 1923 is to be a banner one for the Cleveland Motor Co., according to Sid Black, vice-president. Production this year will be from 60 to 70 per cent greater than last year, according to the record made thus far.

The demand for closed cars has been surprising to executives of the company. Extra care was taken in designing and producing the sedan and Black says sales have indicated the consumer has appreciated every extra stroke of work put in on the car. Sixty per cent of all the cars produced by the company this year have been enclosed models, and they have found a market as ready to take them as the open cars.

The popularity of the closed cars is said by Black to be responsible in no small degree for the very good sales record made by the company's dealers this year. The company started out on the theory that a popular priced sedan and a small differential in cost between all closed and open models would help sales as much as anything that could be done.

Black and his co-executives figured that in America there are thousands of prospects who want a closed car at either an open car price or as near to it as it is possible to come. The closed models of the Cleveland Motor Co. were priced to reach this class particularly.

August this year has been a good month, sales running 39 per cent in excess of the record for the same month a year ago.

McELHONE WITH EATON

NEW YORK, Aug. 26.—Arthur J. McElhone has been appointed advertising manager of the Eaton Axle & Spring Co., of Cleveland. McElhone for years has been connected with the service department of the Class Journal Co., and of late has specialized on bumper advertising of the Cox Brothers Manufacturing Co., which only recently affiliated with the Eaton company.

PAN-AMERICAN DIVIDEND

DECATUR, Ill., Aug. 27.—Judge J. S. Baldwin has ordered payment of a 12½ per cent dividend to creditors of the defunct Pan-American Automobile Co. This is the first payment to creditors of this concern and comes from sale of personal property. Another payment is expected to follow closely upon the real estate sale.

FORD BUSY AT MEMPHIS

MEMPHIS, Tenn., Aug. 25.—Engineers of the Ford Motor Co. have been in Memphis the last few days looking over sites on the river front and elsewhere for a prospective enlargement of their assembly plant here.

The READERS' CLEARING HOUSE

Questions & Answers on Dealers' Problems

Straightened Front Axle May Not Stand Up

Q—We were called in to repair a car, damaged by collision with another car some weeks ago. The front axle was bent and twisted. We put in a new one. The owner sued the other fellow for the repair bill and won it. The defense severely ridiculed us for using a new axle. I was on the witness stand in defense of our charges. I explained to the jury that a front axle could not be straightened by the crude methods of a repair shop, that is, hammers, anvil and press. We won the case but the defense had the shop foremen from three large agencies here to swear that they could hammer and press a front axle straight.

I will be glad if you will answer this through MOTOR AGE. It is my belief that thousands of motorists are paying more than the price of a new front axle in wear and grind on tires, bad steering, etc. Let us have your opinion on this important matter.—Porter-Gilbert Motor Corp., Roanoke, Va.

The safest course to follow in case of a bent front axle is to return the axle to the maker and have it straightened and reheat treated. MOTOR AGE has secured the opinion of many metallurgical engineers employed by the prominent axles companies and all have been of the same general opinion. For example a certain well known front axle has a tensile strength of approximately one hundred thousand pounds. These same axles are also heat treated to eliminate all forging and straightening strains. If the axle is bent cold it would have a straightening strain which is very injurious especially when the axle has to be straightened through a wide angle.

Of the several methods of straightening it is preferable to straighten cold where the bend is slight as the original heat treatment is then not disturbed and the tensile strength consequently is not greatly impaired or reduced. There are three other methods commonly used, all of which are considered very bad practice by men well versed in the properties of metals.

Method No. 1, consists of straightening hot and quenching when red. All agree that this treatment will make the steel very short and brittle. It would have considerable quenching strain and doubtless would stand very little shock on account of the brittleness.

Method No. 2 is to straighten hot and allow to cool in air. This method will show around sixty-four to sixty-five thousand pounds tensile strength on an axle with an original tensile strength of one hundred thousand pounds. It would have no straightening strain and no quenching strain but its ability to stand bending from shock will of course be reduced about 50 per cent.

The 3rd method is to straighten hot and quench in cold water when black. This method gives approximately the

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

same tensile strength as method No. 2 but the cooling of the axle in water will set up a quenching strain in the axle structure.

The question of straightening axles sums up something like this, if the axle is straightened cold through any great angle the result will be a strain set up in the axle due to the straightening. As it is impossible for the average establishment to determine the magnitude or location of this strain it is unsafe to straighten using this method where the axle is to be put to any severe service.

This method when used on axles that are bent through a wide angle and axles of alloy steel is especially dangerous because the complete failure of the axle may result in case of a sudden shock imparted to the axle by a bump in the road or other obstructions.

We have heard of cases where axles straightened both cold and hot have re-bent when the car was driven around a curve at speeds around 40 to 50 m.p.h.

This means that ordinarily an axle that does not have an unusually large factor of safety may give trouble even in ordinary driving, if straightened and not re-heat treated.

The quenching strains which are imparted to an axle when the axle is heated to straighten are very injurious because the condition of the strain is not known, nor it is known whether the load will be against or with the strain.

In conclusion therefore the safe method to follow is either to use a new axle or to have the axle straightened and then returned to the maker to be given the proper heat treatment so as to relieve any possible straightening or quenching strains. Quenching strains usually tend to make an axle brittle.

STARTER WORKS WHEN GENERATOR BRUSH DOES NOT LIFT

Q—We have a little problem here in regard to a Delco generator on a Buick E-45. Since installing new brushes in the generator the starting motor seems to have lost all power. When the ignition switch is turned on the starter cranks the engine very slowly but when the ignition switch is turned off the starter cranks the engine very rapidly.

The only way we have been able to start the engine is to leave the ignition switch off and whirl the engine over a few times, then pull the ignition switch out and the engine will generally start before the starting motor slows down much. The battery is new and shows 1250 gravity and all connections are O. K. What is the cause of this condition?—C. M. Kellogg, Barnes, New York.

Successful operation of this Delco motor generator depends on the pedal mechanism dropping a starting brush down onto the commutator and raising a generator brush at the time the gears get into mesh. In installing the new generator brushes you probably have them so long that the mechanical action is not sufficient to lift the generator brush from the commutator. When you try to use the machine as a starting motor and a generator at the same time the drag is so great that you can only get slow operation from the starter. If you will either shorten the generator brush in question, this being—the one that is supposed to be lifted by the mechanism, or else adjust the mechanism so that the brush is lifted from the commutator you will find your trouble is overcome.

NOTICE

By error the maintenance data sheet on page 48 of the August 9, 1923, issue of MOTOR AGE was headed, "Crankshaft and Connecting Rod Bearing Sizes for 1923 Passenger Cars." This should have read "1922 Passenger Cars."

Durant Recommends Getting Architectural Suggestions

Q—We have been advised by the sales-department of the Durant Motor Co., Lansing, Mich., to write you to see if you have any plans to offer for a salesroom and service station for one of our dealers. Should there be any cost connected with this, we would not have the authority to approve same without first consulting our dealer, so therefore, should there be any costs, we would be pleased to have you so advise us.

Our dealer expects to build a brand new one story building on a lot which is not a corner lot, 45x155 ft. with cinder alley at the rear, the distance in the alley from the rear of the lot to the side street being about 125 ft.

We have suggested the advisability of having an accessory window with a parts department in one front corner of the building, the balance of the front to be showroom, and without any drive-way from the front street to the back of the building, using instead the alley entrance, as this will always be open and probably will be paved with concrete in the near future.

In addition to the showroom, stockroom and offices, there should be a shop for about six cars, a washrack, etc. There will probably be required offices for one principal and two assistants.

With this information, we should be glad to have any suggestions or plans if your service contemplates anything of this character, and beg to thank you very kindly in advance.—S. Y. Brigham Motor Co., Toledo, O.

We have laid out a plan for your dealer, incorporating all the ideas you suggested, as far as it is possible.

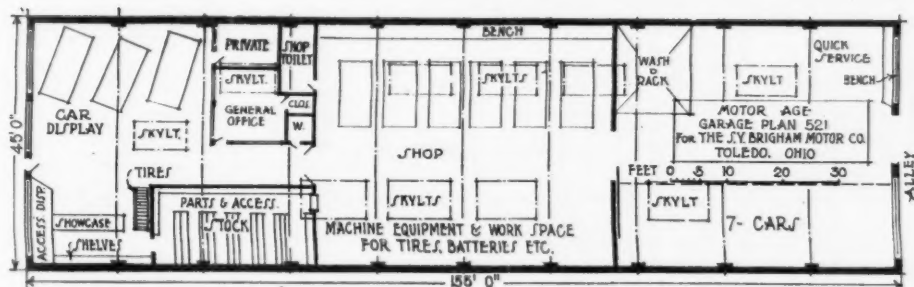
Since the alley entrance is the only one to the garage and service station, we have placed the service station in the center of the building with the garage at the rear. This makes the service station a little more private and also places it nearer to the stockroom. Employees can get their parts through the rear window, and the stockkeeper may be the attendant in the accessory store. It may be advisable to install a buzzer at the rear stockroom window so that mechanics may get service easily. Partitions may be moved forward or backward, as it is advisable to make the shop or garage larger.

WRIST PIN CARVES ITS TRADE MARK IN THE CYLINDER WALL

Q—Advise the cause of the following trouble with a Daniels 1921 car. We had the cylinder block reground, new piston rings and wrist pins installed and the connecting rods were lined up before the pistons were replaced. After the car had run 1500 miles we took off the cylinder head and found in two cylinders that holes had been formed in the cylinder walls. These were 1/16 in. deep, were the shape of a half moon and were located at the bottom of the stroke opposite the wrist pin. There was, however, no sign of a score in between the bottom and top of the stroke.

We took the other pistons out at this time and put in new wrist pins in all. Then the car was run about 400 miles and started to knock and get hot during a long drive. We took the cylinder heads off again and found the same cylinder walls with the same holes in them. In addition we found four other cylinder walls in the same condition and two of these had slight scores all down the stroke.

The following are the facts on this re-



Architectural Service

IN giving architectural advice, **MOTOR AGE** aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things,

we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected to be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.

ground job. The wrist pins were $\frac{1}{8}$ in. shorter than the piston diameter. The locks on the wrist pins were all in place so that the wrist pins could not get out and score. The standard Daniels piston has a recess about 2 in. square around the wrist pin boss. The replacement pistons that we used did not have this recess. What is the cause of this trouble?

1—The wrist pins used in Daniels cars have holes in them into which the set screws fit. In one boss in each piston a set screw is used which goes down into the hole in the wrist pin. The set screw however, is not a perfectly tight fit and allows a slight play of the wrist pin back and forth in the piston boss. It would be our opinion that the wrist pins were too long and you can easily check this by taking a piston and wrist pin and leaving the connecting rod off.

With the wrist pin in place you can then insert the set screw. Then move the wrist pin back and forth and see if it does not come out past the surface of the piston. A proper length wrist pin is one that is about $\frac{1}{8}$ in. short at each end, in other words about $\frac{1}{4}$ of an in. shorter than the piston diameter. The set screw locates the wrist pin and allows less than $\frac{1}{16}$ in. movement. It is therefore impossible for the wrist pin to come closer than $\frac{1}{16}$ in. of the outer piston surface.

In your particular case there may have been circumstances which aggravated the condition. For example, there may have been end play in the crankshaft which tends to move the connecting rods back and forth. It is also possible that the connecting rods were not perfectly aligned. Perhaps you checked them for straightness but did not check them for twist. At any rate it would be impossible even with a bent rod to make the wrist pins score if they were of the proper length and properly locked.

2—What is the correct way to time this engine?—Stockton Service Company, Pittsburgh, Pa.

2—Place the spark lever on the steering wheel sector in a $\frac{1}{3}$ advance position. Turn the engine with the hand crank until No. 1 left piston is at the top dead center at the end of compression

stroke. Loosen the timing adjustment screw in the center of the distributor shaft and turn the breaker cam so that the rotor button will be in a position under No. 1 high tension terminal when the distributor head is properly located. Locate the breaker cam carefully in this position so that when the slack in the distributor driving gear is rocked forward, the contact will be opened by the breaker cam, and when the slack in the gears is taken up by rocking backward the contacts will just close.

The distributor shaft rotates clockwise when viewed from the top. Tighten the adjusting screw securely and replace the rotor and distributor head. After you have the ignition properly timed it will do no harm to make a final check by turning the starting crank nearly two revolutions. Then turn the starting crank very slowly by hand until it comes up to its former position. At just this instant the interrupter points should be opened by the action of the cam.

SPECIAL AMMETER NEEDED WITH SOME MOTOR GENERATORS

Q—Give information as to trouble on a Dodge car with Northeast four wire generator. 20 point amperes gage in series with battery. When connection is made with starter switch ampere gage jumps over as far as it can go and sticks over.—Howard A. Foster, East Norton, Mass.

The regular equipment of the Dodge which had the four wire Northeast system included a current indicator instead of an ammeter and it is impossible to use the conventional style of ammeter in this car as the entire starting current from the battery passes through the meter. The value of this current is in excess of 100 amperes and you can readily see what the effect would be on the ordinary ammeter. There has recently been placed on the market however, a special high reading ammeter which can be inserted in the circuit in the same manner as the original current indicator.

The name and address of the company making this meter will be furnished by letter.

Wiring of 1923 Overland Sedan

Q—Supply wiring diagram of starting and lighting system on 1923 Overland sedan. I observe that the dash light is connected in series with the taillight, thus preventing turning off the dash light at night. Will changing to parallel connection make it possible to turn off the dash light?

1—Wiring diagram is shown as requested. We believe that it would be well to leave the wiring as it is, for the dash light acts as an indicator and shows whether the taillight is burning or not. We do not believe that it is objectionable if the shield keeps the light from shining in the driver's eyes.

It would, of course, be possible to change the wiring so as to have the two lights independent. You would then need 6-8 volt bulbs instead of 3-4 volt bulbs. From the rear terminal on the lighting switch you would need a wire going directly to the taillight and from the battery terminal of the lighting switch you would need a wire going directly to the dash light. The dash light would then have to be of a type which has a switch mounted in its base or else a separate switch would have to be used, and the other terminal of the dash light would need to be connected to a ground on the frame of the car or engine.

2—Supply oiling diagram on the same car.

2—An oiling diagram is hardly required for the system is similar to that used on Ford cars. The oil supply is carried in the crankcase and the rotation of the flywheel throws the oil to all parts of the flywheel housing. Some of it settles in a pocket in the upper part of the flywheel housing and flows through an oil strainer and an oil pipe to the lower part of the engine. This lubricates the gears, and the oil then returns through the various pans to the rear part of the engine. The pan to which the oil returns has a depression into which the connection rods dip and the oil is accordingly splashed by the connecting rods to the camshaft, cylinder walls and other parts needing lubricating.

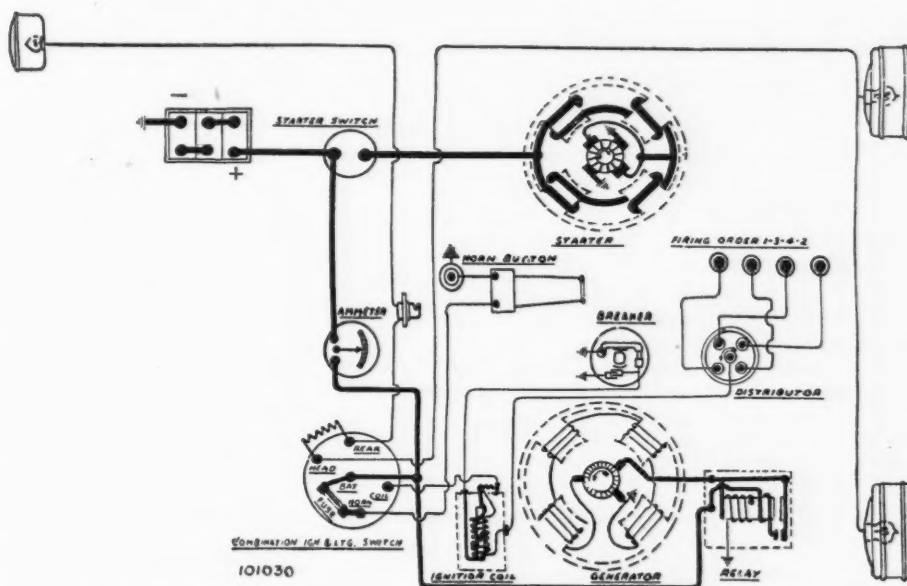
3—Where is the most likely place for squeaks to develop in a new car?—Ohio Subscriber.

3—Squeaks may develop in the springs or spring shackles, also in fenders and body. While not a very scientific method, it is sometimes found effectual to take an oil can and oil the joints between fenders and car, between fenders and running board shield and whatever sheet metal rubs against parts of the car. In doing this it is, of course, necessary to wipe off excess oil.

INTERNAL CIRCUITS OF WAGNER GENERATOR ON ELGIN

Q—Give internal wiring diagram of a Wagner generator used on Elgin Six model 1917, also maximum output and motoring speed.

1—Diagram is shown as requested. The maximum output should be 15 amperes at 1650 r.p.m. or 20 m.p.h. The motoring speed would be about 600 r.p.m.



2—Give method of testing field coils of a Disco generator as installed on a 1916 Partin-Palmer. These pole pieces seem to be cast integral with the generator frame so give method of removing and replacing field coils over flanged portion of pole piece. Also state maximum output and motoring speed of this generator.

2—You can test the field for ground with 110 volt test line with a lamp in series with one side of it. Touch one test point to the field winding and the other to the frame of the machine and if the lamp lights up it shows the field coil is grounded.

There are two ways of testing the fields for shorts. One is to see how much current each coil draws from a six volt battery, using an ammeter to check the current. The other way is to run current through all of the field coils and use a voltmeter across the coils one at a time and compare the voltages. If the voltage of one coil is way low it shows it is shorted. On the previous test if one coil draws much more current than the others it shows it is shorted.

The field poles of this machine have a projection in one direction only so that it is possible to put the coils on by slipping them over this projection first and then forcing them over the straight side of the pole. They are then probably var-

nished again and held in place by the varnish or with wedges. In removing field coils of this kind however, it is very difficult to do so without damaging them. That is all the data we have available on the Disco machine.

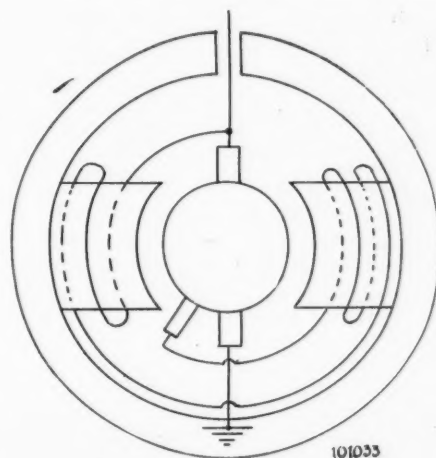
3—Could a Westinghouse generator with external regulation be used in place of the Disco?

3—We assume that you wish to use the same Ward-Leonard regulator which was used with the Disco generator and change generators only. If you are good enough as an electrician to trace out the circuits and connect the generator properly, you can doubtless do this. However, you may have to change the resistance in the regulator somewhat as it may cause flashing at the points, if the resistance is too much for the Westinghouse machine, or it may not hold the current down at high speeds if the resistance is too low.

We assume that you refer to one of the round Westinghouse generators having two terminals, one of which is the armature connection and the other the field connection. In this case the armature connection should go to the armature terminal on the Ward-Leonard regulator and the field connection of course to the field terminal.

4—What is the highest charging rate that can be safely maintained on a Ford generator?—C. E. B., Corydon, Ind.

4—10 to 12 amperes is considered correct for the Ford generator. However, in very cold weather a higher charging rate, up to 15 or 16 amperes, may be used. Under all conditions the safe charging rate is determined by the temperature of the machine. For example 25 amperes would be safe if the machine were run only two or three minutes. On the other hand 10 amperes might be too much if the machine were running across a desert all day long on a very hot day. The electrician must accordingly use some discretion but in general 10 amperes would be about right for summer and 15 for winter.



When Is a Positive Ignition Coil?

Q—The Connecticut company have on the market positive and negative coils number 225-Y to be used when the negative or positive terminal of the battery is grounded. Give internal diagram for both coils and description if necessary to make it clear why the same coil cannot be used in both cases.—An Old Subscriber.

1—The direction that the spark jumps across the sparkplug gaps in a battery ignition system, depends on the direction of primary current, also on the direction the primary and secondary coils are wound. However, after a coil is once built the direction of secondary current depends on the direction of primary current.

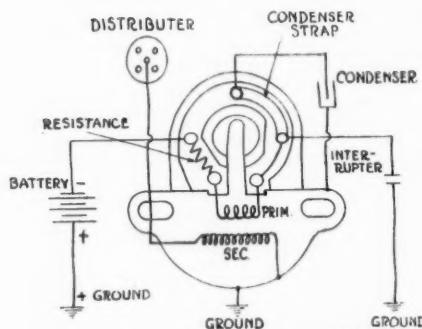
If the spark from a battery ignition coil is allowed to jump a $\frac{1}{4}$ -in. gap in air, it will be seen that there is a thin white streak through the center with a reddish color around the edges and the red portion is always nearer the negative electrode than the positive one. This means that the negative end of the spark is somewhat hotter than the positive end.

In the spark plugs used in an automobile engine, the center electrode goes down through a porcelain sleeve and is thereby insulated from the rest of the engine. This also has the effect of causing the center electrode to run hotter than the one which is set in the shell of the spark plug.

The theory in support of having a definite polarity to the spark at the plugs then depends on having the current flow in such a direction that the center electrode will be negative, so that the heat of spark will occur at the hottest electrode.

Inasmuch as magnetos generating alternating current and consequently alternating the direction of flow of current at the spark plug have been used for many years with undeniable success, it seems questionable whether the theory above mentioned is of very great consequence when it comes to a practical test on a car. However, as it is as easy to lay out a battery system one way as the other, it sometimes happens that engineers will figure on this point and design ignition coils accordingly.

To the best of our knowledge, it is conditions of this sort that determine the design of positive and negative coils to which you refer. Wiring diagrams of the two cars are given and we will first



Connecticut negative coil 225-1-Y

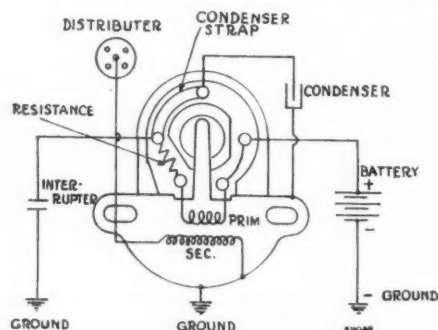
refer to the coil number 225-1-Y which is known as a negative and is designed for use with a battery having the positive side grounded.

The view shown is the bottom of the coil and the primary, secondary and condenser are shown diagrammatically. There is also a resistance. The resistance is used where no automatic switch is used. Former Connecticut systems used an automatic switch which itself contained a resistance, and with the automatic feature eliminated it is necessary to have the resistance somewhere in the circuit, so it is incorporated in the coil. The condenser, of course, is located in the coil although shown outside in the diagram so that the circuit will be easily traced. The primary and secondary are, of course, also in the coil although diagrammatically shown on the base plate.

If we trace the flow of current from positive battery through the negative coil we will see that the circuit leads first to ground and then over to the interrupter. The flow through the interrupter takes us to the right side of the coil and the current goes back through the primary resistance, passing from right to left. This will give a definite polarity to the secondary spark current. If we use the same coil and same connections and merely turn the battery around so that the negative is grounded, we reverse the current in the primary and consequently reverse the direction of secondary spark.

The recommended practice however, is to make the connections as shown in the diagram of the positive coil. Here we reverse the connection of battery and interrupter, grounding the negative battery. The current now flows from positive battery to the coil but it will be seen that it still flows from right to left through the coil, so that the secondary current will still go in the same direction.

In reversing these connections it is also necessary to reverse the condenser strap connection for it is essential to have the condenser connected across the contacts. This means the condenser will be grounded at one terminal and the other end must be connected to the insulated terminal on the interrupter. If the condenser had been built in the interrupter and not in the coil we would not have this detail to take care of. Changing a coil, however, from negative to positive is apparently simple, as the condenser strap is easily unsoldered and can be swung over to the reverse position.



Connecticut positive coil used with negative grounded

WORN CAMS MAY PRODUCE A KNOCK

Q—Advise us if possible what makes the knock in the Mitchell F 40. We have two or three of these cars in our territory which have only been run around 9,000 miles. The knock is only noticeable when the engine is idling. If speeded up the noise leaves.

We have taken up the main and connecting rod bearings, have examined the alignment of connecting rods, put in a new set of timing gears and have examined the camshafts for end play which is hat not got. Also installed new piston pins.—Stahl Bros., Sykesville, Pa.

Some of the most probable causes of knocks in an engine when idling are broken piston rings, too high oil pressure and end play in the crankshaft. Although you do not mention it in your letter, we have assumed that you have checked over the camshaft bearings for up and down play and that you have tested the shaft for worn cams.

If you have not done these things you can test for worn cams by inserting a feeler gage between the push rod and the valves stems, when the cam is in the no-lift position. If the cams are worn uniformly, which is the desirable condition, there will be no change in clearance from the time that the valves first close until they are just ready to open.

In other words, if you insert a .003 feeler under one valve stem after the valves have just closed and then turn the engine by hand slowly, and find that as you turn it the clearance increases to 10 or 12 thousandths, it is an indication that the cam faces are worn unevenly and this will cause a knock which will appear at idling speeds.

During the time you are making this test it would be advisable to also check over the entire valve opening mechanism, the push rods, the push rod guides, etc.

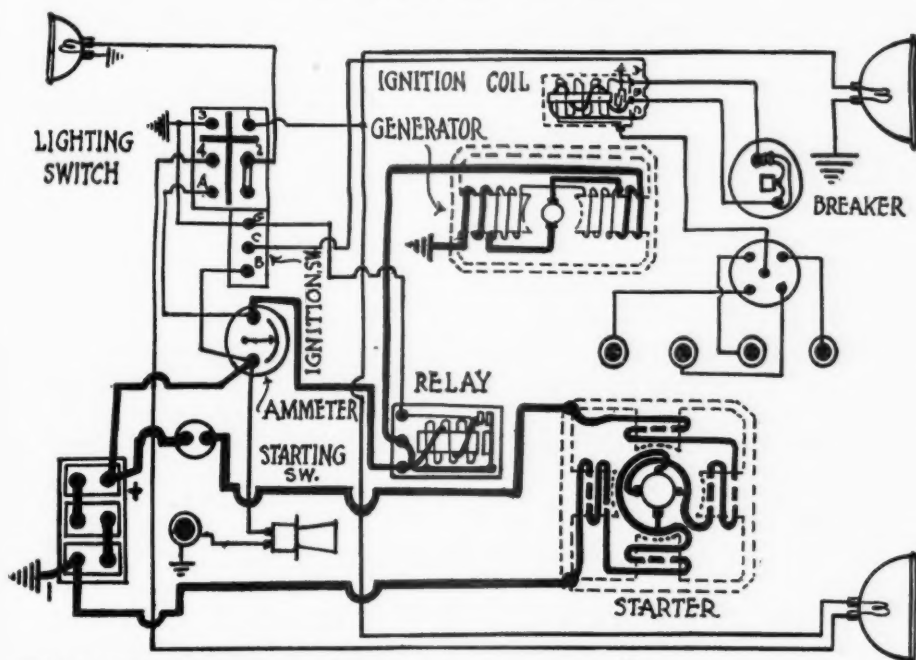
The check for end play in the crankshaft can be made while the engine is running, by using a round piece of wood to push against the crankshaft. If the construction of the engine is such that you cannot push directly against the end of the crankshaft while the engine is running, the test can be made at the opposite end of the shaft by moving the flywheel in and out with a piece of wood shaped like a broomstick.

WHERE TO GET SCRIPPS-BOOTH PARTS

Q—Where can oversized pistons and repairs for a 1916 model D-16-8 cylinder Scripps Booth be secured?—Ralph R. Ray, Doon, Iowa.

1—The engine used in the 1916-8 cylinder Scripps Booth was manufactured by the Ferro Foundry and Machine Co., Cleveland, O. This is one source of securing repairs. As for repairs for the chassis, we would suggest that you communicate with the General Motors Co., Detroit, Michigan, as this car was originally a General Motors Product. Another source of parts for the engine is the Earl Motor Co., which was formerly the Briscoe.

Wiring of 1917 Monroe



WIRING DIAGRAM ON MONROE MODEL M-3 1917. * 190624

Q—Send us a wiring diagram, ignition and lighting system. This car is a Monroe. There is a number on the frame on left-hand side 5652, we think the model

is 1917.

Wiring diagram of the Monroe car 5652, which is a 1916-17 model, is shown.

WIRING AND LUBRICATION OF STUDEBAKER

Q—Send wiring diagram of Studebaker 1916, 6.

Wiring diagram of the Studebaker 1916-6 is shown.

2—What type of oiling system is used and where is the pump located?

2—The Studebaker engine is lubricated with what is known as a circulating splash system. The oil is drawn from the oil pan through a gear pump located at the rear end of the camshaft. The discharge or outlet side of the pump is connected to the distributor pipe on the left-hand side of the engine inside the crankcase. This pipe has several holes at different points along its length through which the oil flows into troughs and the oil in the dip pan stands at a constant level. At each revolution extensions on the connecting rods called

splashers dip into these troughs and splash oil onto the pistons, crankshaft bearings, etc. At the forward end of the distributor pipe is another hole through which oil flows to the timing gears and finally returns to the oil pan through a duct in the crankcase.

Pinion Shaft Retained by Lock Nut

3—How is the drive pinion shaft on a 1918 Studebaker 4 removed? Does the pinion shaft release at the transmission housing and how does the pinion adjusting lock come out; does it screw out or does the pinion shaft housing slip out with pinion and shaft? R. S. Bement, Wichita, Kan.

3—After having removed the front end of the transmission; that is, the front end cover, which will carry with it the various countershaft gears, you will have remaining in the transmission case only the transmission pinion shaft. You

will notice at the pinion end of this shaft, inside of the transmission housing, a large serrated nut. This nut carries the adjustable Timken bearing and in order to remove the pinion shaft it is necessary to unscrew this nut. In other words, the shaft lock nut or adjusting nut will not slip out, but must be screwed out of the case.

FORD TIMING AND OILING FOR HIGH SPEED

Q—In speeding up a Ford engine is it advisable to set the timing ahead one or two teeth? This Ford is equipped with a stock model 8 valve head. This has about 10 pounds more compression than the regular Ford. What would be the best kind of oil to use for summer and winter use? Light, medium or a mixture of the two? Would it be advisable to use two cylinder head gasket with the above? Would it handle the present day grade of gasoline with the two gaskets?—Lloyd Flanagan, Camargo, Ill.

The best timing for speed is arrived at only by experimenting. On most Ford engines where the stock camshaft is retained the timing is advanced one tooth. If the car is to be used as a touring car or for road work use a light mineral oil. If it is to be used for racing a castor oil or some of the blended oils are considered best.

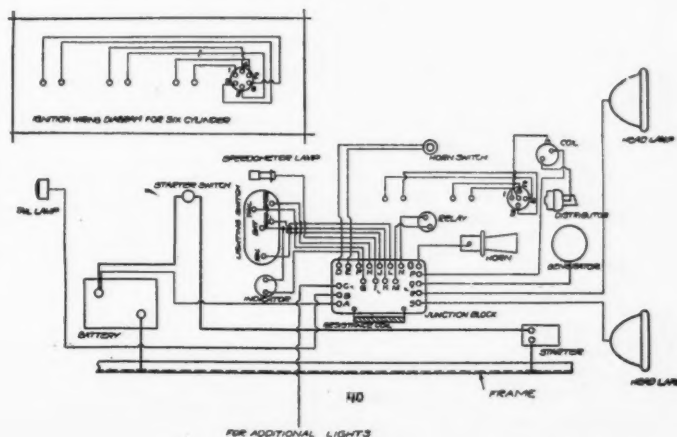
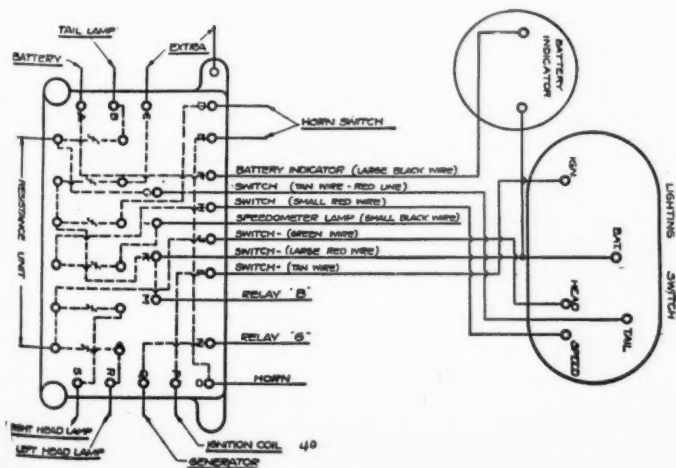
If you wish to use the engine for speed and get the most from the overhead valves we would advise that you use only one gasket. Whether this will or will not cause the engine to pound due to fuel knocks we cannot say, but we would advise that you first try it with only one gasket.

A BASHFUL READER FROM MASSACHUSETTS

One of our subscribers signing himself a Massachusetts Reader has sent us a nice long letter. He wrote four or five pages and made two very good diagrams. One showed the magnetic circuits of a Dixie magneto while the other gave his views on the problem reviewed on page 12 of the July 26th issue of MOTOR AGE.

If he will give us his name and address we will gladly answer his letter.

*"Engineering for the Service Man."
The fourth article in this series will
be found on page 15 of this issue.*



BOOSTING ACCESSORY SALES

Winter Driving to Pay Big Dividends If You're Prepared

HAVE you started your campaign for fall and winter driving yet? It wasn't so hard to promote summer touring, was it? People just went naturally, but with fall and winter driving, it is something else again. Don't think for a minute that motorists do not want to drive their cars in winter—they do. Winter is the time when a car is really worth while and when a few letters from you would keep many of the cars on the street in your town and incidentally keep things moving for you during the cold weather, surely, it is worth the effort.

You know there are plenty of anti-freeze solutions and radiators fixtures which successfully do away with the only resistance to winter driving, freezing. You know that there are a few things which the owner himself can do which will aid in keeping the car running perfectly and when he knows what those things are, he will have more confidence in his car.

A few years back, it was a common sight to see some person "stuck" with a disabled car during cold weather but now, there are only a few careless individuals who fall victims to freezing. It is not necessary and the sale of closed cars is evidence enough in itself to let you know that people are going to drive in winter. Why not sell them the few necessities for winter driving that will assure them of an enjoyable time through those months.

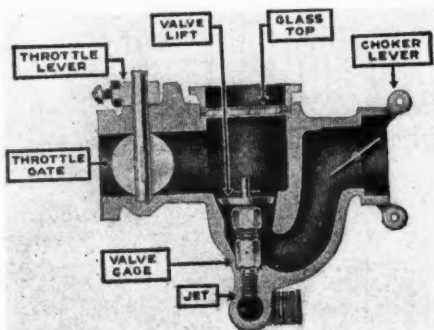
Give them the information on lubrication that they need and you will profit.

The Luther Grinder Mfg. Co. of Milwaukee, Wisconsin, has recently placed a new water circulating pump for Fords on the market. It is claimed that the pump will pump a radiator full of cool water through the motor once a minute at a car-speed of 20 miles an hour. It automatically keeps the motor temperature to the point of most efficiency. The Flood retails for \$5. Luther Grinder Mfg. Co., Milwaukee, Wis.

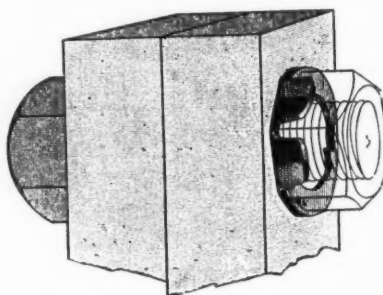
The Yale Reserve Gas Tank is the product of the Yale Corp., Los Angeles, Cal., and fits under the filler cap. The Ford and Chevrolet models hold enough gasoline to drive two to four miles and sell at \$1.

Climax Automatic Cap is made by the Climax Automatic Cap Co., 4317 N. Western avenue, Chicago. Designed with a special locking feature which secures it to the radiator of the car, the Climax cap is theftproof. It opens instantly for putting in water and provides a locked holder for the motor meter. The lock and spring device are also applied to oil and gasoline caps. Prices of the radiator caps are \$6 and \$4 and the price of the gasoline tank cap is \$3.50.

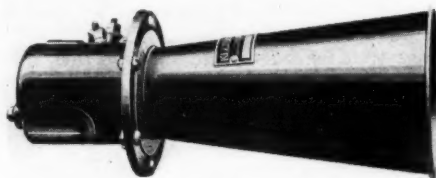
The Waynesboro Nut Lock Co., Inc.,



No-Float carburetor



Bull Dog nut lock



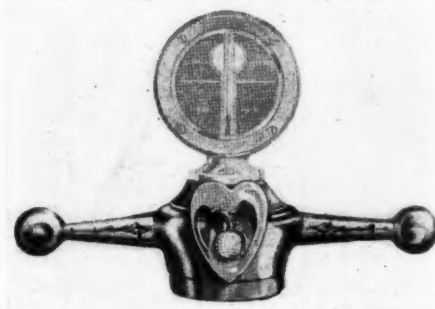
Klaxon horn

Waynesboro, Pa., has placed on the market, the Bull Dog Nut Locks, designed for effective operation wherever difficulty in keeping nuts tight on account of shock or vibration is experienced. These nut locks require no special tools, bolts or nuts for application but can be applied to any bolt with an ordinary wrench.

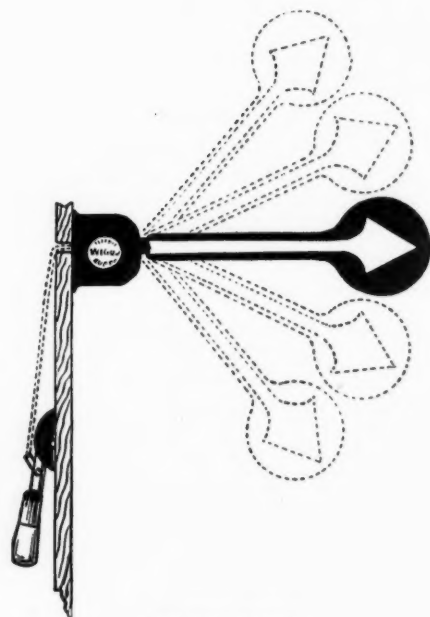
The "Wiggler" Signal is the product of the Wiggler Corp., Buffalo, N. Y., and is designed especially for use on trucks. It sells at \$3 and allows the driver to keep both hands on the wheel at all times because it indicates plainly, any turn or action contemplated.

The No-Float Carburetor is made by the Huber-Morris Co., 219 N. Channing avenue, St. Louis, Mo. It is automatically controlled by vacuum and gravity and has neither float nor adjustments, the cut-away illustration printed on this page, shows the functioning of the carburetor. The price of the No-Float, complete, is \$7.50.

A new low-priced model horn has just been announced by the Klaxon Company,



Climax automatic cap



Wiggler signal

which is known as the "Klaxon-7," selling for \$4.95. It is motor-driven, ball-bearing, and self-lubricating.

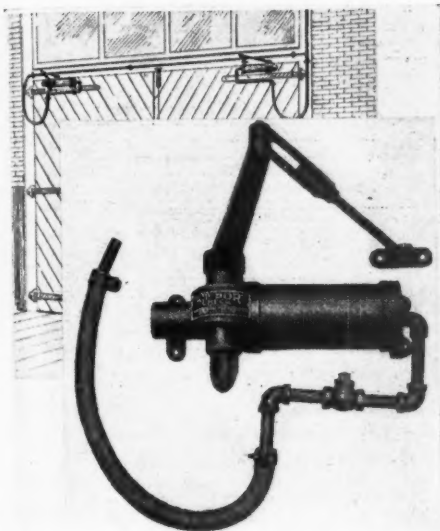
A protecting cover for the motor renders it practically fool-proof and entirely moisture-proof. The armature is built along the lines of a regular power motor armature. The commutator and brush material has been so designed that it furnishes its own lubrication automatically and does not require any attention from the car owner.

The real ball-bearing is of the thrust type, which eliminates end play and reduces friction in the motor to a minimum. It is made adjustable to insure proper tone value to the note which the horn sounds. The diaphragm is of specially fabricated high carbon steel.

The Frank Rose Mfg. Co., Hastings, Nebr., has placed on the market, the Rose Top Cover for Ford cars, designed to re-cover worn tops of used Ford cars. This cover sells at \$9 and adds greatly to the appearance and resale value of a used car.

GETTING MORE OUT of the SHOP

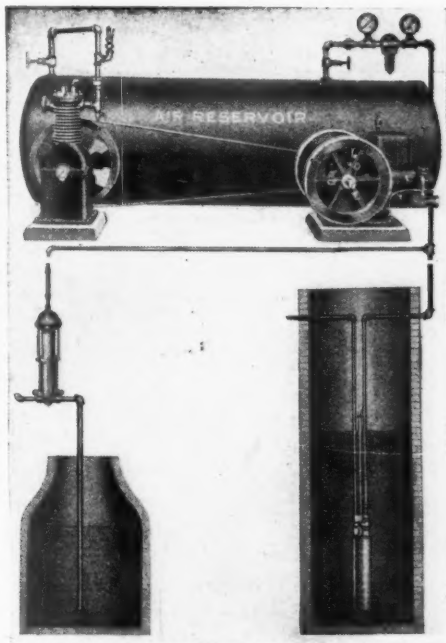
Dealer Tells How He Defines "Service" and Maintenance



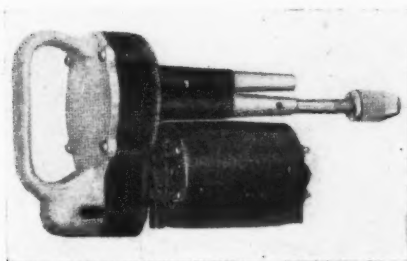
Air-dor control



Wilkie All-Purpose aligner



National Utilities water and air supply



Jackson electric valve grinder

THE other day, we talked to a dealer friend about shop and shop expense. "I have lost in past years," he said, "several thousand dollars in my shop simply because I was satisfied with what new car sales were bringing me. I handed out more free service than I believe any other dealer ever dared to and I paid the price."

This dealer thinks that he was one of a thousand—he does not know that very near every other transportation merchant is daily committing this same mistake of giving away half of his profits but he has a new and very interesting slant on things since reading "What Do You Charge for and What Do You Give Away?" in MOTOR AGE of August 23.

He has taken from that article, the list of things given as free service and the list of things given as chargeable maintenance and he has vowed that those things he shall hereafter adhere strictly to. He believes that if other dealers

would do this same thing, that they would begin to realize a little on their shops. He is going to tell the new car buyer hereafter, just what things he will receive without charge and just what things he will have to pay for.

The National Utilities Corporation of Milwaukee, Wis., has a system of water supply which is ideal for garages and service stations located in the country and in small towns where city water is not to be had. Instead of storing water in tanks, as is usually the case, an air reservoir is used which supplies air pressure to operate a cistern or deep well pump which in turn supplies fresh water directly to the fixtures.

Since air pressure is a standard necessity in garages, one of these systems simplifies equipment, as one compressor will furnish both water and air for shop use. The equipment is made in capacities to satisfy any demand and to be operated by electric motor or gas engine the electric equipment may be automatic.

Wilkie Machine Works, Winona, Minn., announces the Universal Wilkie All Purpose Aligner, which combines three tools in one: a universal connecting rod aligner, a universal piston aligner and a universal set of arbors. The cut shows the tool in use as a connecting rod aligner. By turning the face plate over, it is possible to align any piston and shows also, if cross bore of piston is not square. In its third use is the set of arbors, making for correctness in every alignment as well as for fitting bearings, rebabbiting, gaging sizes, etc.

The Brownbilt Spring Bolt Assortment and cabinet, sells at \$117.63, complete with 189 bolts. The cabinet has 28 drawers, containing bolts, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, and $\frac{3}{4}$ ins. in diameter and lengths from $2\frac{3}{4}$ to $4\frac{3}{4}$ ins., in quantities selected according to demand. The cabinet is made entirely of steel. The retail price of the bolts is from 45 to 95 cents each. The Brown Co., Syracuse, N. Y., are the manufacturers.

The Jackson Electric Valve Grinder sells at \$37.50. It combines the grinder and drill in one tool and embodies the additional features of a more powerful motor, heavier parts and drill spindle and chuck. Its capacity as a grinder is up to $3\frac{1}{2}$ in. valve; its capacity as a drill is $\frac{1}{4}$ in. Universal 110-volt motor. It is manufactured by Corwill Jackson, 532 Railway Exchange Bldg., Chicago.

"Air-Dor" controls are door opening and closing devices manufactured by the Michigan Metal Products Co. of Battle Creek, Mich. They operate by air pressure and are controlled by valves which may be located in as many parts of the building as desired. They are priced at \$125 a set, including two controls, regulating check valves; one pressure regulator; two spring door bumpers and one operating valve. Extra operating valves are \$7.50 each.

Automobile, truck and heavy duty jacks are made by the Oliver Barth Jack Co., Milwaukee, Wis. Specially designed heavy duty jacks for use in the garage and shop are specialized in by this company.

Too much cannot be said on the subject of free service and chargeable maintenance. You would do well to do as the dealer mentioned above is doing—take the list of things mentioned in the article on page 9 of MOTOR AGE of August 23 and make it plain to customers before they drive out in their new cars just what the service guarantee covers.

Too many people are under the impression that the three months' service guarantee means replacing the car if it should happen to crash into something through the driver's carelessness. The quicker the truth of service is known, the better for you and your pocketbook.

COMING MOTOR EVENTS

AUTOMOBILE SHOWS

Chicago	Commercial Vehicle Show	Sept. 1-7
Chicago	Chicago Closed Car Show, Coliseum	Oct. 13-20
Chicago	Annual Salon, Drake Hotel	Jan. 26-Feb. 2, 1924
Columbus, Ga.	Automobile Show	Oct. 15-20
Dallas, Texas	Annual Fall Show	Oct. 13-28
Dallas, Texas	Annual Automobile Show	Feb. 11-17, 1924
Danbury, Conn.	Automobile Show in Conjunction with State Fair	Oct. 1-6
Fresno, Calif.	Automobile Show	Sept. 28-Oct. 5
Green Bay, Wis.	Annual Automobile Show	Aug. 27-30
Indianapolis	Annual Fall Automobile and Accessory Show	Sept. 3-8
Kingston, N. Y.	Industrial Exposition of Kingston Automotive Dealers	Aug. 27-Sept. 1
Little Rock, Ark.	Annual Automobile Show	Oct. 8-13
Louisville, Ky.	Automobile Show at the Jefferson County Armory	Feb. 18-23
Memphis	Annual Automobile Show	Sept. 28-30
Milwaukee	Ninth Annual Fall Show in Conjunction with Wisconsin State Fair	Sept. 3-8
Muscatine, Iowa	Automobile Show	Sept. 5-8
New York	Annual Closed Car Show	Oct. 1-6
New York	Foreign Automotive Association Exposition	Nov. 4-10
New York	Annual Salon, Hotel Commodore	Nov. 11-17
Peoria, Ill.	Implement and Vehicle Show	Sept. 26-Oct. 6
Pittsburgh	Annual Fall Show at the Motor Square Gardens	Sept. 22-29
Richmond, Ind.	Wayne County Fair Assn. Passenger Car Show	Sept. 11-14
Sacramento	Annual Automobile Show	Sept. 3-8
Salt Lake City	Fall Show in Conjunction with State Fair	Oct. 1-6
Sioux City, Ia.	Automobile Show in Conjunction with Annual Fair	Sept. 16-22

Waco, Texas	Annual Automobile Show	Oct. 20-27
Washington, D. C.	Annual Fall Closed Car and Accessory Show	Oct. 20-Nov. 5
Washington, D. C.	Annual Fall Automobile Show	Oct. 28-31

FOREIGN SHOWS

Buenos Aires	Annual Automobile Exposition	Nov. 1-15
London	Motor Car Exposition	Nov. 2-10
Montevideo, Uruguay	Automobile Show	September
Montreal	Closed Car Show	Sept. 29-Oct. 6
Ottawa, Ont.	Automobile Show	Sept. 7-17
Paris	Truck and Tractor Show at Grand Palais	Oct. 24-Nov. 2

RACES

Altoona Speedway		Labor Day
Fresno, Calif.	Auspices of the A. A. A.	Sept. 27
Italy	Monza Speedway, 500 miles	Sept. 9
Kansas City Speedway	Auspices of the A. A. A.	Oct. 17
Pikes Peak Hill Climb		Sept. 3

CONVENTIONS

Boston, Mass.	Fall Convention, M. A. M. A.	Sept. 19-21
Chicago	Exhibit and Convention of Automotive Equipment Association	Nov. 12-17
Cleveland, O.	Society of Automotive Engineers Production Meeting	October
Cleveland, O.	Thirtieth Annual Convention, National Assn. of Farm Equipment Manufacturers	Oct. 24-26
Columbus, O.	Annual Convention, Ohio Trade Assn.	Dec. 5-6
New York	National Tire Dealers' Assn. Convention	Nov. 13-15

SQUEEKS & RATTLES

C'mon gang

Beg Your Pardon!



Last week we printed a picture on this page and put "Kay Em" Roberts' monicker underneath it. "Kay Em" now tells us that the Des Moines police must have given us the wrong picture as the one above is none other than himself, drawn by himself and for himself. We apologize.

Not at Home

"You now receive callers in your machine."
"I know. Several motor cops have left cards."—Judge.

Exactly

Diner—"I have eaten much better steaks than this one."
Waiter (through force of habit)—"Not here, sir, not here."
—American Legion Weekly.

There's the Rub

"Mr. Daring," said the director, "in this scene a lion will pursue you for five hundred feet."
"Five hundred feet?" interrupted the actor.
"Yes, and no more than that—understand?"
The hero nodded. "Yes, I understand, but does the lion?"—Black and Blue Jay.

Joe Hass tells about a tin roof of a Kansas store that was torn off and rolled into a compact bundle by a cyclone. Having a sense of humor, the owner wrapped a few strands of baling wire around the ruin and shipped it to Henry Ford. In due time came a communication saying:
"It will cost you \$48.50 to have your car repaired. For heaven's sake, tell us what hit you!"

—The Crescent.

Some Lew Lus

Lubricate service with the oil of politeness.

"Good intentions," says Rex Beach, "like bright metals, soon tarnish."

Which makes us think of the Christmas presents we got last year.

And causes us to do away with our good intentions before they get a chance to tarnish.

Our verse on Autumn last week has brought many scathing remarks from folks who know us, but at least we're frank and open about it.

LEW BRICATION.

Current Motor Truck Specifications

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE			REAR AXLE		TIRES		MAKE AND MODEL	Tons Capacity	Price	ENGINE			REAR AXLE		TIRES			
			Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Make & Model				Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear		
Ace.....30	1 1/2	\$2690	Mi-412	3 3/8x5	B-L	B-L	Ti-6560	WO	34x3 1/2	34x5k	Double Dr. DFT	3	\$4000	Bu-ETU	4 1/2x5 1/2	B&B	Own	WO	36x6	36x6	
Ace.....40	2-2 1/2	3250	Mi-402	4 1/2x5 1/2	B-L	B-L	Ti-6160	WO	36x4k	36x7k	Duplex.....G1	1 1/2	.....	Bu-WTU	3 3/8x5 1/2	B-L	B-L	Ti-5511	SB	33x5	33x5n
Ace.....60	3	3800	Mi-402	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO	36x4	36x8	Duplex.....GH	1 1/2	.....	Bu-WTU	3 3/8x5 1/2	Cov.	Cov.	Sh-1501	WO	35x5	36x5n
Acme.....20	1 1/2	.....	Co-N	3 1/2x5	B&B	Cot.	Ti-6250	WO	34x5n	34x5n	Duplex.....A2	2	2775	Hi-400	4x5 1/2	Cov.	Cov.	Sh-103	WO	35x5n	38x7n
Acme.....30	1-1 1/2	.....	Co-N	3 1/2x5	B&B	Cot.	Ti-6352	WO	34x3 1/2	34x5	Duplex.....AC	2 1/2-3	3500	Hi-400	4x5 1/2	B-L	B-L	Vu-4	WO	34x5	36x8
Acme.....40	1 1/2	.....	Co-J4	3 1/2x5	B&B	Cot.	Ti-6160	WO	34x3 1/2	34x5	Duplex.....E3 1/2	3 1/2	.....	Bu.....	4 1/2x5 1/2	B-L	B-L	Own	IG	36x8	36x8
Acme.....60	2 1/2	.....	Co-K4	4 1/2x5 1/2	B&B	Cot.	Ti-6560	WO	36x4	36x7	Eagle.....101	1-1 1/2	1875	Bu-MU	3 3/8x5 1/2	Cov.	Cov.	To-8406	IG	3 1/2x5n	34x5n
Acme.....90	3 1/2	.....	Co-L4	4 1/2x5 1/2	B&B	Cot.	Ti-6660	WO	36x5	40x10	Eagle.....100	2	2275	Bu-CTU	3 3/8x5 1/2	Cov.	Cov.	Ru-6000	IG	34x4k	34x7k
Acme.....125	5 1/2	.....	Co-B5	4 1/2x6	B&B	Cot.	Ti-6760	WO	36x6	40x12	F. W. D.....B3	3	4200	Wi-A	4 1/2x5 1/2	H-S	Cot.	Own	SP	36x6	36x6
Amer. La France	3 1/2	4950	Own	4 1/2x6	Own	Own	Own	WO	36x5	36x5	Fageol.....196	1 1/2	3000	Wa-CT	3 3/8x5 1/2	B-L	Own	Ti-6461	WO	34x3 1/2	34x6
Amer. La France	5 1/2	5500	Own	4 1/2x6	Own	Own	Own	WO	36x6	40x6	Fageol.....216	2 1/2	3900	Wa-CU	4 1/2x5 1/2	B-L	Own	Ti-6560	WO	34x4k	36x7
Armleder.....21	1 1/2	.....	Bu-GTU	3 3/8x5 1/2	Ful	Ful	Ti-6460	WO	34x3 1/2	34x6k	Fageol.....4	1	5000	Wa-DU	4 1/2x5 1/2	B-L	Own	Ti-6666	WO	36x5	36x5d
Armleder.....HWP	2 1/2	.....	Bu-HTU	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO	36x4k	36x4dk	Fageol.....6	1	5700	Wa-DU	4 1/2x5 1/2	B-L	Own	Ti-6760	WO	36x6	40x6d
Armleder.....HWC	2 1/2	.....	Co-CL	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO	36x4k	36x4dk	Federal.....R21	1 1/2	.....	Co-J4	3 1/2x5	B&B	Det.	Ti-6250	WO	33x5n	33x5n
Armleder.....KWB	3 1/2	.....	Bu-YTU	4 1/2x5 1/2	B-L	B-L	Ti-6666	WO	36x5k	36x5dk	Federal.....S21	2 1/2	.....	Co-J4	3 1/2x5	B&B	Own	Ti-6252	WO	34x5n	36x6k
Armleder.....KWC	3 1/2	.....	Co-EL	4 1/2x5 1/2	B-L	B-L	Ti-6666	WO	36x5k	36x5dk	Federal.....U2	2 1/2	.....	Co-K4	4 1/2x5 1/2	B&B	Det.	Ti-6560	WO	36x4	36x8
Atlas.....25	1 1/2	1495	Bu-WTU	3 3/8x5 1/2	B&B	Own	Own	WO	34x4 1/2	34x4 1/2	Ford.....T1	1 1/2	380	Own	3 1/2x4	Own	Own	Ti-6760	WO	36x6	40x6d
Atlas.....40	1 1/2	1950	Bu-WTU	3 3/8x5 1/2	B&B	Own	Own	WO	36x6	40x7d	Front Drive.....K16	1 1/2	2800	Bu-CTU	3 3/8x5 1/2	B&B	Own	Own	WO	36x3 1/2	32x4 1/2
Atterbury.....20R	1 1/2	2475	Co-J4	3 1/2x5	Ful	Ful	Ti-6160	WO	34x4k	34x6k	G.M.C. K41A&B	2	.....	Own	4 1/2x5 1/2	Own	Own	Ti-6560	WO	36x4	36x7
Atterbury.....22C	2 1/2	1375b	Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO	36x1k	36x4d	G.M.C. K41T	2	.....	Own	4 1/2x5 1/2	Own	Own	Ti-6560	WO	36x4	36x8
Atterbury.....22D	2 1/2	1275b	Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6660	WO	36x5	40x6d	G.M.C. K71A&B	3 1/2	.....	Own	4 1/2x6	Own	Own	Ti-6666	WO	36x5	40x5d
Atterbury.....8E	5-6	1975b	Co-B2	4 1/2x6	B-L	B-L	Ti-6760	WO	36x6	40x7d	G.M.C. K71T	3 1/2	.....	Own	4 1/2x6	Own	Own	Ti-6666	WO	36x5	40x12
Autocar.....21	1 1/2	2200	Own	4 1/2x5 1/2	Own	Own	Own	DR	34x4	34x6	G.M.C. K101A&B	5	.....	Own	4 1/2x6	Own	Own	Ti-6760	WO	36x5	40x6d
Autocar.....27	2-3	3100	Own	4 1/2x5 1/2	Own	Own	Own	DR	34x4	34x6	G.M.C. K101T	5	.....	Own	4 1/2x6	Own	Own	Ti-6760	WO	36x5	40x14
Autocar.....26	1-6	4200	Own	4 1/2x5 1/2	Own	Own	Own	DR	34x5	36x8	Garford.....151	1 1/2	1590	Bu-MU	3 3/8x5 1/2	B&B	Own	Ti-6250	WO	34x5n	34x5n
Available.....JH	1 1/2	2450	He-O	4x5	B-L	B-L	Ti-6460	WO	36x3 1/2	36x5	Garford.....25B	1 1/2	2375	Bu-WU	3 3/8x5 1/2	Own	Own	Ti-6460	WO	36x3 1/2	36x5
Available.....H2	1 1/2	3160	He-CU3	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO	36x4	36x8	Garford.....70H	2 1/2	3250	Bu-HTU	4 1/2x5 1/2	Own	Own	Ti-6560	WO	36x4	36x8
Available.....H3	1 1/2	4175	He-MU3	4 1/2x5 1/2	B-L	B-L	Ti-6666	WO	36x5	40x5d	Garford.....77D	1	4200	Bu-YTU	4 1/2x5 1/2	Own	Own	Ti-6666	WO	36x5	36x5d
Available.....H5	1 1/2	5375	He-T3	5x6	B-L	B-L	Ti-6760	WO	36x6	40x12	Garford.....68D	5	5000	Bu-BTU	5x6 1/2	Own	Own	Ti-6760	WO	36x6	40x6d
Avery.....1-1 1/4	.....	.....	Own	3x4	Own	Own	To-0X2	IG	34x5n	34x5n	Garford.....150A	7 1/2	5750	Bu-BTU	5x6 1/2	Own	Own	Own	Ch	36x6	40x7d
Bassemmer.....G1	1450	Co-N	3 1/2x5	Ful	Ful	To-A	IG	35x5n	35x5n	Gary.....F1	1 1/2	1775	Bu-WU	3 3/8x5 1/2	Ful	Ful	Ti-6352	WO	36x3 1/2	36x5	
Bassemmer.....H2	1 1/2	1995	Co-N	3 1/2x5	B&B	Bak	LM-7150	DR	36x3 1/2	36x5	Gary.....J2	2 1/2	2150	Bu-GTU	4 1/2x5 1/2	Ful	Ful	Ti-6460	WO	36x3 1/2	36x7
Bassemmer.....J2	2 1/2	2895	Co-C2	4 1/2x5 1/2	B&B	B-L	LM-7250	DR	36x4	36x4d	Gary.....J3	3 1/2	2850	Bu-HTU	4 1/2x5 1/2	Ful	Ful	Ti-6560	WO	36x4	36x8
Bassemmer.....K2	1 1/2	3495	Co-E7	4 1/2x5 1/2	B&B	B-L	To-E	IG	36x5	36x10	Gary.....K3	3 1/2	3790	Bu-YTU	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO	36x5	40x10
Bethlehem.....KN1	1385	Own	3 1/2x5	B&B	B-L	Det	Ea-1000	SB	35x5n	35x5n	Gary.....M5	5 1/2	4150	Bu-BTU	5x6 1/2	B-L	B-L	Ti-6760	WO	36x6	40x12
Bethlehem.....GN2	2185	Own	4x5 1/2	B&B	Det	Wi-80A	DR	34x4	34x6	Graham Bros. BDF	1 1/2	1265	Do.....	3 1/2x4 1/2	Dod	Dod	Own	SB	33x4 1/2	34x5n	
Bethlehem.....HN3	2985	Own	4x5 1/2	Ful	Ful	Wi-88E	DR	36x4	36x8	Graham Bros. CEF	1 1/2	1245	Do.....	3 1/2x4 1/2	Dod	Dod	Own	SB	33x4 1/2	34x5n	
Brookway.....E21	1 1/2	.....	Wi-SU	4x5	B-L	B-L	Co-5200	SB	33x5n	33x5n	Gramm-Pion.....10	1 1/2	1750	Co-N	3 1/2x5	B&B	B-L	Sa-1483	SB	33x5n	33x5n
Brookway.....S1 1/2	.....	.....	Wi-SU	4x5	B-L	B-L	Ti-6160	WO	36x4	36x6	Gramm-Pion.....15 1/2	1 1/2	2250	Co-J4	3 1/2x5	Ful	Own	Ea-603	WO	36x3 1/2	36x5k
Brookway.....K2 1/2	.....	.....	Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO	36x4	36x8	Gramm-Pion.....20	2 1/2	2475	Co-K4	3 1/2x5 1/2	Ful	Own	Sh-103	WO	36x4k	36x8k
Brookway.....R3 1/2	.....	.....	Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6660	WO	36x5	36x5d	Gramm-Pion.....30	3	3300	Hi-500	4 1/2x5 1/2	Own	Own	Sh-21	WO	36x5k	36x10k
Brookway.....T5	.....	.....	Co-B5	4 1/2x6	B-L	B-L	Ti-6760	WO	36x6	40x7d	Gramm-Pion.....40	4	3850	Hi-200	4 1/2x5 1/2	Own	Own	Sh-31	WO	36x5k	36x10k
Buick.....23-4-SD	3/4	945	Own	3 1/2x5 1/2	Own	Own	SB	31x4n	31x4n	Harvey.....W0A	2	4450	Co-B2	4 1/2x6	Own	Own	Sh-51	WO	36x6k	40x6k	
Case.....FR2	.....	.....	Own	4 1/2x5 1/2	TD	Own	To-C139	IG	36x6n	38x7n	Harvey.....W0B	2	2650	Bu-ETU	4 1/2x5 1/2	Ful	Ful	Sh-103	WO	34x4	34x7
Chevrolet.....Supr	.....	575	Own	3 1/2x4	Own	Mun	Own	SB	31x4n	34x4 1/2	Harvey.....W0C	2	2950	Bu-ETU	4 1/2x5 1/2	Ful	B-L	Sh-21	WO	36x4	36x8
Clydesdale.....10	1 1/2	.....	Co-N	3 1/2x5	B&B	B-L	Ti-5511	SB	34x5n	34x5n	Harvey.....W0D	2	3950	Bu-YTU	4 1/2x5 1/2	Ful	B-L	Sh-32	WO	36x6	36x12
Clydesdale.....8 1/2	.....	.....	Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6460	WO	36x4	36x7	Harvey.....W0E	2	3050	Bu-ETU	4 1/2x5 1/2	Ful	B-L	Sh-21	WO	36x5	36x10
Clydesdale.....6 1/2	.....	.....	Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO	36x5	36x5d	Harvey.....W0F	2	4050	Bu-YTU	4 1/2x5 1/2	Ful	B-L	Sh-32	WO	36x6	36x12
Clydesdale.....4 1/2	.....	.....	Co-B5	4 1/2x6	B-L	B-L	Ti-6660	WO	36x6	40x6d	Hendrickson.....N	3	2525	Bu-WTU	3 1/2x5 1/2	Ful	Ful	Ti-6460	WO	36x4	36x5
Clydesdale.....2-6-7	.....	.....	Co-B5	4 1/2x6	B-L	B-L	Ti-6760	WO	36x7	40x7d	Hendrickson.....M	4	3200	Bu-ETU	4 1/2x5 1/2	Ful	Ful	Ti-6560	WO	36x4	36x7d
Commerce.....9 1/2-1 1/4																					

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES		MAKE AND MODEL	Tons Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES	
			Make & Model	Bore & Stroke			Make & Model	Final Drive	Front	Rear				Make & Model	Bore & Stroke			Make & Model	Final Drive	Front	Rear
Larrabee...X2	1-1/2	.....	Co-SR..	3 3/4x4 1/2	B-L.	B-L.	Sh-1480	SB..	34x5n	34x5n	Sandow.....J	2 1/2	\$2750	Co-C4..	4 1/2x5 1/2	B-L.	B-L.	Ti-6560.	WO.	36x4	36x7
Larrabee...J4	1 1/2-2 1/2	.....	Co-J4..	3 3/4x6	B-L.	B-L.	Sh-1501	WO.	34x3 1/2	34x5 1/2	Sandow.....M	5	4325	Co-B5..	4 1/2x6	B-L.	B-L.	Ti-6760.	WO.	36x6	40x12
Larrabee...K5	2 1/2-3 1/2	.....	Co-L4..	4 1/2x5 1/2	B-L.	B-L.	Sh-22..	WO.	36x4	36x8	Sanford.....10	1 1/2-1 3/4	.....	Co-SR1.	3 3/4x4 1/2	B-L.	B-L.	Sh-1501	WO.	36x3 1/2	36x5 1/2
Larrabee...L4	3 1/2-4 1/2	.....	Co-L4..	4 1/2x5 1/2	B-L.	B-L.	Sh-31..	WO.	36x5	36x10	Sanford.....15	1 1/2-2	.....	Co-N..	3 3/4x5	B-L.	B-L.	Sh-21..	WO.	36x4 1/2	36x5 1/2
Macar...L2	1 1/2	.....	Co-K4..	4 1/2x5 1/2	B-L.	B-L.	Ti-6460.	WO.	36x4	36x6	Sanford.....25	2 1/2-3 1/2	.....	Co-C4..	4 1/2x5 1/2	B-L.	B-L.	Sh-31..	WO.	36x5	36x5 1/2
Macar...HA	2	.....	Co-K4..	4 1/2x5 1/2	B-L.	B-L.	Ti-6560.	WO.	36x4	36x4 1/2	Sanford.....35	3 1/2-4 1/2	.....	Co-E4..	4 1/2x5 1/2	B-L.	B-L.	Sh-51..	WO.	36x5	40x6 1/2
Macar...H2	2	.....	Co-L4..	4 1/2x5 1/2	B-L.	B-L.	Ti-6666.	WO.	36x5	36x6 1/2	Schacht.....1	1 1/2	2500	Wi-L..	4x5	Ful.	Wi..	DR.	36x3 1/2	36x7	
Macar...M3	3	.....	Co-L4..	4 1/2x5 1/2	B-L.	B-L.	Ti-6760.	WO.	36x6	40x6 1/2	Schacht.....2	2	3200	Wi-UAU	4 1/2x6	B&B.	Own.	Own.	WO.	36x5	36x5 1/2
Macar...G	5-6	.....	Co-B2..	4 1/2x6	B-L.	B-L.	Ti-6760.	WO.	36x6	36x10	Schacht.....3	3	3800	Wi-UAU	4 1/2x6	B&B.	Own.	Own.	WO.	36x5	40x6 1/2
MacDonald...A	5-6	\$5500	Bu-WTU	3 3/4x5 1/2	B-L.	B-L.	**Own.	IG.	40x7	40x14	Schacht.....4	4	4400	Wi-UAU	4 1/2x6	B-L.	B-L.	Ti-6250.	WO.	34x5n	34x5n
MacDonald...AB	11	8000	Bu-YTU	4 1/2x6	B-L.	B-L.	**Own.	IG.	40x7	40x14	Schacht.....5	5	4600	Wi-UAU	4 1/2x6	B-L.	B-L.	Ti-6460.	WO.	34x4	34x3 1/2
Mack...AB	11	3000	Own.	4x5	Own.	Own.	Own.	Ch.	36x4	36x3 1/2	Schwartz.....20	1-1 1/2	2840	Bu-GTU	4 1/2x5 1/2	B-L.	B-L.	Ti-6560.	WO.	34x5	34x5 1/2
Mack...AB	11	3450	Own.	4x5	Own.	Own.	Own.	Ch.	36x4	36x3 1/2	Schwartz.....21	1 1/2	3480	Bu-ETU	4 1/2x5 1/2	B-L.	B-L.	Ti-6666.	WO.	36x6	36x6 1/2
Mack...AB	11	3300	Own.	4 1/2x5	Own.	Own.	Own.	Ch.	36x4	36x4 1/2	Schwartz.....22	2 1/2	4160	Bu-YTU	4 1/2x5 1/2	B-L.	B-L.	Ti-6760.	WO.	36x6	36x7 1/2
Mack...AB	11	3750	Own.	4 1/2x5	Own.	Own.	Own.	Ch.	36x4	36x4 1/2	Selden.....30C	1 1/2	2375	Co-J4..	3 3/4x5	B-L.	B-L.	Ti..	WO.	34x3 1/2	34x5 1/2
Mack...AB	11	3400	Own.	4 1/2x5	Own.	Own.	Own.	Ch.	36x4	36x4 1/2	Selden.....50B	2 1/2	3250	Co-K4..	4 1/2x5 1/2	B-L.	B-L.	Ti..	WO.	36x4 1/2	36x7 1/2
Mack...AB	11	3850	Own.	4 1/2x5	Own.	Own.	Own.	Ch.	36x4	40x5 1/2	Selden.....53B	2 1/2	3550	Co-L4..	4 1/2x5 1/2	B-L.	B-L.	Ti..	WO.	36x5 1/2	36x10 1/2
Mack...AC	3 1/2	4950	Own.	5x6	Own.	Own.	Own.	Ch.	36x5	40x6 1/2	Selden.....70B	3 1/2	4175	Co-L4..	4 1/2x5 1/2	B-L.	B-L.	Ti..	WO.	36x5 1/2	36x10 1/2
Mack...AC	6 1/2	5500	Own.	5x6	Own.	Own.	Own.	Ch.	36x6	40x6 1/2	Service.....12	3 1/2	.....	Co-B5..	4 1/2x6	B-L.	B-L.	Ti..	WO.	36x6 1/2	40x12
Mack...AC	6 1/2	5750	Own.	5x6	Own.	Own.	Own.	Ch.	36x6	40x12	Service.....25	1 1/2	.....	Mi-110	3 3/4x4 1/2	Del.	Det.	Ti-5311.	SB..	32x4 1/2	32x4 1/2
Mack...AB	7 1/2	6000	Own.	5x6	Own.	Own.	Own.	Ch.	36x7	40x7 1/2	Service.....33	1 1/2	.....	Bu-WTU	3 3/4x5 1/2	B-L.	B-L.	Ea-1000.	SB..	34x5n	34x5n
Mack...AB	7 1/2	3400	Own.	4 1/2x5	Own.	Own.	Own.	Ch.	36x5	40x5 1/2	Service.....42	2	.....	Bu-GBU	4 1/2x5 1/2	B-L.	B-L.	Ti-6352.	WO.	34x3 1/2	34x6
Mack...AC	10	4950	Own.	5x6	Own.	Own.	Own.	Ch.	36x6	40x6 1/2	Service.....61	3 1/2	.....	Bu-EBU	4 1/2x5 1/2	B-L.	B-L.	Ti-6460.	WO.	36x4	36x7
Mack...AC	10	5500	Own.	5x6	Own.	Own.	Own.	Ch.	36x6	40x12	Service.....81	1 1/2	.....	Bu-EBU	4 1/2x5 1/2	B-L.	B-L.	Ti-6560.	WO.	36x4	36x8
Mack...AC	13	5750	Own.	5x6	Own.	Own.	Own.	Ch.	36x7	40x7 1/2	Service.....103	6	.....	Bu-EBU	4 1/2x5 1/2	B-L.	B-L.	Ti-6666.	WO.	36x5	36x10
Mack...AC	15	6000	Own.	5x6	Own.	Own.	Own.	Ch.	36x7	40x7 1/2	Signal.....NF	1 1/2	.....	Bu-YBU	4 1/2x6	B-L.	B-L.	Ti-6760.	WO.	36x6	40x12
Mack...AC	15	1200	He..	4x5	Hoo.	War.	FL.	SB.	34x5n	34x5n	Signal.....H	2 1/2	.....	Co-J4..	3 3/4x5	B-L.	B-L.	Ti-6352.	WO.	34x5n	36x6
Mason...11	1 1/2	.....	Bu-WTU	3 3/4x5 1/2	Ful.	Ful.	Ti-5511.	SB.	33x5n	33x5n	Signal.....M	3 1/2	.....	Co-K4..	4 1/2x5 1/2	B-L.	B-L.	Ti-6460.	WO.	34x4	36x6
Master...21	1 1/2	.....	Bu-OU.	4 1/2x5 1/2	Ful.	Ful.	Ti-6460.	WO.	34x4	36x8	Signal.....R	7 1/2	.....	Co-L4..	4 1/2x5 1/2	B-L.	B-L.	Ti-6560.	WO.	36x5	40x10
Master...41	2 1/2	.....	Bu-ETU	4 1/2x5 1/2	Ful.	Ful.	Ti-6560.	WO.	34x4	36x8	Signal.....R	7 1/2	.....	Co-B5..	4 1/2x6	B-L.	B-L.	Ti-6760.	WO.	36x6	40x12
Master...51	3 1/2	.....	Bu-YTU	4 1/2x5 1/2	B-L.	B-L.	Ti-6666.	WO.	35x5	40x10	Standard.....75	1 1/2	1330	Co-N..	3 3/4x5	B-L.	B-L.	Ti-6352.	WO.	34x3 1/2	34x5
Master...61	5	.....	Bu-YTU	4 1/2x5 1/2	B-L.	B-L.	Ti-6760.	WO.	36x5	40x12	Standard.....1 1/2	1 1/2	1695	Co-N..	3 3/4x5	B-L.	B-L.	Ti-6560.	WO.	36x4	36x8
Master...64	5-6	.....	Bu-ATU	4 1/2x5 1/2	B-L.	B-L.	Ti-6760.	WO.	36x6	40x14	Standard.....2 1/2	2 1/2	2795	Co-K4..	4 1/2x5 1/2	B-L.	B-L.	Ti-6666.	WO.	36x5	36x12
Maxwell...1	1 1/2	1095	Own.	3 3/4x4 1/2	Own.	Own.	Ti..	WO.	35x5n	35x5n	Standard.....3 1/2	3 1/2	3615	Co-L4..	4 1/2x5 1/2	B-L.	B-L.	Ti-6666.	WO.	36x6	40x14
Menominee...B	1	1650	Wi-SU..	4x5	B&B.	Det.	Co-5200	SB.	35x5n	35x5n	Standard.....5K	5	4495	Co-B5..	4 1/2x6	B-L.	B-L.	Ti-6760.	WO.	36x6	40x14
Menominee...HT	1 1/2	2000	Wi-FAU	3 3/4x5	Ful.	Del.	Wi-800G	WO.	34x3 1/2	36x5 1/2	Star.....1	1 1/2	6100	Co-B5..	4 1/2x6	Own.	War.	Ti..	SB..	36x3 1/2	36x3 1/2
Menominee...D	2-2 1/2	2175	Wi-EAU	4x5	Ful.	Del.	Wi-800G	WO.	36x3 1/2	36x5 1/2	Sterling.....2	2	3240	Wa-FU..	4x5 1/2	B-L.	B-L.	Ti-6460.	WO.	36x4 1/2	36x5 1/2
Menominee...D	2-2 1/2	2875	Wi-TAU	4x6	Ful.	Del.	Wi-800G	WO.	36x4	36x8	Sterling.....2	2	3440	Wa-FU..	4x5 1/2	B-L.	B-L.	Ti-6560.	WO.	36x4 1/2	36x5 1/2
Menominee...J	5	2875	Wi-RAU	4x6	B&B.	Det.	Ti-6760.	WO.	36x6	40x12	Sterling.....2 1/2	2 1/2	3700	Wa-FU..	4x5 1/2	B-L.	B-L.	Ti-6666.	WO.	36x5	40x5 1/2
Moline...10	1 1/2	1695	Own.	3 1/2x5	B&B.	Own.	To-A..	IG.	34x5n	36x6n	Sterling.....3 1/2	3 1/2	4750	Wa-FU..	4x5 1/2	H-S.	Own.	Ti-6760.	WO.	36x6	40x6 1/2
Moreland...R.R	1	1595	He-O..	4x5	B-L.	B-L.	Ti-5512.	WO.	34x5n	34x5n	Sterling.....5	5	5400	Wa-FU..	4x5 1/2	H-S.	Own.	Ti-6760.	WO.	36x6	40x6 1/2
Moreland...EX	1 1/2	1980	He-O..	4x5	B-L.	B-L.	Ti-6461.	WO.	36x3 1/2	36x6	Sterling.....7 1/2	7 1/2	6500	Wa-FU..	4x5 1/2	H-S.	Own.	Ti-6760.	WO.	36x6	40x7 1/2
Moreland...EX	2	2625	Co-K4..	4 1/2x5 1/2	Own.	Own.	Ti-6461.	WO.	36x4	36x8	Stewart.....16	16	990	Wa-FU..	4x5 1/2	H-S.	Own.	Ti-6760.	WO.	36x6	40x7 1/2
Moreland...RX	3	3500	Co-L4..	4 1/2x5 1/2	Own.	Own.	Ti-6560.	WO.	36x5	36x10	Stewart.....15-X	1 1/2-1 3/4	1495	Co-MU.	3 3/4x5 1/2	Ful.	Cl-AW	IG.	35x5n	35x5n	
Moreland...RX	5	4600	Co-B5..	4 1/2x6	Own.	Own.	Ti-6666.	WO.	36x6	40x12	Stewart.....9	1 1/2-2	1870	Co-N..	3 3/4x5	Ful.	Cl-ID..	IG.	34x4 1/2	34x6 1/2	
Nash...2018	1-1 1/2	1595	Own.	3 3/4x5 1/2	B&B.	Det.	Cl-ID..	IG.	34x4	34x5	Stewart.....7K	2 1/2-3	2590	Bu-HTU	4 1/2x5 1/2	Ful.	Cl-ID..	IG.	34x4 1/2	34x6 1/2	
Nash...4017F	2-2 1/2	2750	Bu-HU..	4 1/2x5 1/2	B&B.	Own.	Own.	IG.	36x6	36x6	Stewart.....10X	3 1/2-4	3140	Bu-YTU	4 1/2x6	Del.	Can.	Co-5200	SB..	34x4 1/2	34x4 1/2
Nash...3018	2-2 1/2	2150	Own.	3 3/4x5 1/2	B&B.	Det.	Cl-ID..	IG.	34x4	34x7	Stoughton...AS	3 1/2-4 1/2	1185	Mi-410	3 3/4x4 1/2	B-L.	B-L.	Co-5200	SB..	34x5n	36x6n
Nash...5018	2 1/2	2250	Own.	3 3/4x5 1/2	B&B.	Det.	Cl-ID..	IG.	34x4	34x7	Stoughton...AS	1 1/2	2100	Wa-BUX	3 3/4x5 1/2	B-L.	B-L.	Sh-1501	WO.	36x3 1/2	36x5
Noble...A-75	1	1395	Bu-WTU	3 3/4x5 1/2	Ful.	Ful.	Cl-300.	SB.	34x4 1/2	34x4 1/2	Stoughton...B</										

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE		REAR AXLE		TIRES		MAKE AND MODEL	Tons Capacity	Price	ENGINE		REAR AXLE		TIRES	
			Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive				Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive
Walter.....P12	12	\$3600	Ow.	4x5 1/2	B-L.	B-L.	Ow.	DR.	36x4	36x8							
Walter.....S5	5	5100	Ow.	1 1/2 x 5 1/2	B-L.	War.	Ow.	DR.	36x6	40x6d							
White.....15 3/4	3 3/4	2400	Ow.	3 3/4 x 5 1/2	Ow.	Ow.	Ow.	SP.	34x5n	34x5n							
White.....20 1/2	2 1/2	3250	Ow.	3 3/4 x 5 1/2	Ow.	Ow.	Ow.	DR.	36x4	36x7d							
White.....40 3 1/2	3 1/2	4200	Ow.	4 1/2 x 5 1/2	Ow.	Ow.	Ow.	DR.	36x5	40x5d							
White.....45 1/2	1 1/2	4500	Ow.	4 1/2 x 5 1/2	Ow.	Ow.	Ow.	DR.	36x6	40x6d							
Wilcox.....AA 1	1	1900	Bu-CTU	3 3/4 x 5 1/2	B-L.	B-L.	Ru-3600	SP.	35x5	35x5							
Wilcox.....BB 1 1/2	1 1/2	2550	Ow.	4 1/2 x 5	B&B.	Ow.	Wa-2A	DR.	36x6k	38x7k							
Wilcox.....CC 2 1/2	2 1/2	3000	Ow.	4 1/2 x 5	B&B.	Ow.	Wa-2A	DR.	36x6k	40x8k							
Wilcox.....EE 3 1/2	3 1/2	3950	Bu-YTU	4 1/2 x 6	M&E.	Ow.	Wa-5A	DR.	36x5	36x10							
Wilcox.....F5	5	4350	Bu-ATU	4 1/2 x 6 1/2	M&E.	Ow.	Wa-5A	DR.	36x5	40x5							
Wilson.....C1	1	1350	He-O	4 x 5	B&B.	Det.	Ti-6532	WO.	34x5n	34x5n							
Wilson.....F1 1/2	1 1/2	2270	Co-J4	3 3/4 x 5	B&B.	Cot.	Ti-6460	WO.	36x3 1/2	36x5k							
Wilson.....EA 2 1/2	2 1/2	2825	Co-K4	4 1/2 x 5 1/2	B&B.	Cot.	Ti-6560	WO.	36x4k	36x7k							
Wilson.....G3 1/2	3 1/2	3850	Co-L4	4 1/2 x 5 1/2	B&B.	Cot.	Ti-6660	WO.	36x5k	36x5d							
Wilson.....H5	5	4520	Co-B2	4 1/2 x 6	B&B.	Cot.	Ti-6752	WO.	36x6k	40x6d							
Yellow Cab. M22	3 1/2	1590	Co-V4	3 3/4 x 5	B-L.	B-L.	Ti-5762	SB.	33x4 1/2	33x4 1/2							
Yellow Cab. M42	1 1/2	1640	Co-V4	3 3/4 x 5	B-L.	B-L.	Ti-6352	WO.	35x5n	35x5n							
Yellow Cab. 11-1 1/4	1 1/4	1740	Co		B-L.	B-L.	Ti	WO.									

Current Tractor Specifications

MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Pkws	ENGINE			Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)	MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Pkws	Price	ENGINE			Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)	MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Pkws	ENGINE			Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)
			Make	No. of Cyls Bore & Stroke								Make	No. of Cyls. Bore & Stroke							Make	No. of Cyls. Bore & Stroke			
Allis-Chalmers...	6-12	1	\$295	LeR.	4-3 1/4 x 4	2500	48x 6	Gray.....DU	18-36	4	2150	Wau.	4-4 1/2 x 6	6200	†	Rumely OilPull	30-60	8-10	Own.	2-10x12	26700	80x30		
Allis-Chalmers...	15-25	3	1185	Mid.	4-4 1/2 x 5	4700	48x12	Gray.....EU	22-40	4	2385	Wau.	4-5 x 6 1/2	6900	†	Russell.....	15-30	3-4	Cli...	4-5 x 6 1/2	6000	56x14		
Allis-Chalmers...	20-35	4	1885	Own.	4-4 1/2 x 6	6150	50x12	Hart-Parr.....20	20	2	Own.	2-5 1/2 x 6 1/2	4438	46x10	Russell.....	20-40	4-5	Cli...	4-5 1/2 x 7	7900	60x16			
Allwork.....D	20-38	4-5	1095	Own.	4-5 x 5	6500	48x14	Hart-Parr.....30	30	3	Own.	2-6 1/2 x 7	5220	52x10	Russell.....	30-60	8-10	Own.	4-8 x 10	22550	84x22			
Allwork.....G	14-28	3	1495	Own.	4-4 1/2 x 6	4800	48x12	Hart-Parr. (Road)	30	3	Own.	2-6 1/2 x 7	7560	52x18	Shaw-Enochs (Gr.)	30-60	8-10	LeR.	4-3 1/4 x 4	4400	48x 8			
Allwork.....C	16-30	3	1295	Own.	4-5 x 6	5200	48x12	Heider.....D	9-16	12	Wau.	4-4 1/2 x 5 1/2	4000	54x8	Topp-Stewart.....	30-45	4	Wau.	4-4 1/2 x 6	7800	42x12			
Aultman-Taylor...	15-30	3-4	1900	Cli...	4-5 x 6 1/2	7800	70x12	Heider.....C	12-20	3	Wau.	4-4 1/2 x 6	6000	57x10	Toro.....	6-10	2	8675	LeR.	4-3 1/4 x 4	2900	41x 9		
Aultman-Taylor...	22-45	4-6	3100	Own.	4-5 1/2 x 8	12500	70x20	Heider.....M	5-10	12	LeR.	4-3 1/4 x 4	2800	46x 6	Townsend.....	10-20	2-3	800	Own.	2-6 1/2 x 7	4500	48x12		
Aultman-Taylor...	30-60	8-10	1400	Own.	4-7 x 9	22500	90x24	Huber.....(Light 4)	12-25	3	985	Wau.	4-4 1/2 x 5 1/2	5000	60x10	Townsend.....	15-30	3-4	1350	Own.	2-7 x 8	6500	56x18	
Avery.....15	15	3-4	Own.	4-4 1/2 x 6	4750	50x12	Huber.....(Super 4)	15-30	3	507	Mid.	4-4 1/2 x 6	6000	60x10	Townsend.....	25-50	4-8	2500	Own.	2-8 1/2 x 10	11500	60x24		
Avery.....20-35	20-35	4-5	Own.	4-4 1/2 x 7	7500	60x16	LaCrosse.....M	6-12	1	507	Own.	2-4 x 6	3000	48x 7	Traylor.....	6-12	1	500	LeR.	4-3 1/4 x 4	1750	38x10		
Avery.....25-50	25-50	5-6	Own.	4-6 1/2 x 7	12500	69x20	LaCrosse.....H	12-24	3	850	Own.	2-6 x 7	3800	56x10	Twin City.....	12-20	3	1200	Own.	4-4 1/2 x 6	4550	50x12		
Avery.....45-65	45-65	8-10	Ow.	1-7 1/2 x 8	22000	87 1/2 x 24	Lauson.....S	12-25	3	Mid.	4-4 1/2 x 5 1/2	4200	56x10	Twin City.....	20-35	5	2750	Own.	4-5 1/2 x 8	8100	60x20			
Avery.....Tr. Runner	3	3	Own.	4-4 x 5 1/2	5000	x 8 1/2	Lauson.....T	15-30	4	Bea.	4-4 1/2 x 6	6200		Twin City.....	10-65	8	4750	Own.	4-7 1/2 x 9	23700	84x24			
Avery.....Road Razer	3	3	Ow.	6-3 x 4	4600	42x 6	Leader.....B	12-18	2	375	Own.	2-6 1/2 x 8	4800	50x12	Uncle Sam.....C-20	12-20	2-3	990	Har.	4-4 x 5	3000	46x12		
Bates (St. Mule) H	15-25	3	Mid.	4-4 1/2 x 5 1/2	3600	48x10	Leader.....N	16-32	3-4	1275	Cli...	4-5 x 6	5800	52x12	Uncle Sam.....B-1	20-30	3-4	1535	Bea...	1-4 1/2 x 6	4650	50x12		
Bates (St. Mule) F	18-25	3	Mid.	4-4 1/2 x 5 1/2	4850	56x10	Leader.....GU	16-32	3-4	2150	Cli...	4-5 x 6	60x9	Uncle Sam.....D-21	20-30	3-4	1485	Ba...	4-4 1/2 x 6	4600	50x12			
Bates (St. Mule) G	25-35	4	Mid.	4-4 1/2 x 6	6500	x10	Lincoln.....A	15-30	3	1600	Bud.	4-4 1/2 x 6	5000	40x14	Wallis.....OK	15-27	3	Own.	4-4 1/2 x 5 1/2	3660	48x12			
Bates (St. Mule) 40	30-40	4	Mid.	4-4 1/2 x 6	8500	84x10	Little Giant.....	16-22	4	Own.	4-4 1/2 x 5	5200	54x14	Waterloo Boy.....N	12-25	3	Own.	2-6 1/2 x 7	5869	52x12				
Best.....25-35	25-35	4	1250	Ste...	4-4 1/2 x 6	6000	64x12	Little Giant.....A	26-35	6	Own.	4-5 1/2 x 6	8700	68x20	Wetmore.....	12-25	3	1185	Wau.	4-4 x 5 1/2	2900	46x10		
Best.....30-40	30-40	4	Own.	4-4 1/2 x 6	8100	68x11 1/2	Lombard.....	100	12-16	Own.	6-5 1/2 x 7	19000	x12	Wisconsin.....	16-30	3-4	1750	Cli...	4-5 x 6 1/2	5600	52x12			
Best.....60-100	60-100	9	Own.	1-6 1/2 x 8 1/2	18500	89x20	London.....	12-25	3	Mid.	4-4 1/2 x 5 1/2	48x12	Wisconsin.....	22-40	4-5	2550	Cli...	4-5 1/2 x 7	7500	52x12				
Bryan.....Steam	15-30	3	2500	Own.	2-4 x 5	5500	52x12	McCork-Deering.....	10-20	2	850	Own.	4-4 1/2 x 5	3700	42x12	Yuba (Ball Tread)	15-25	4	2750	Wis.	4-4 x 6	6750	56x12	
Case.....12-20	12-20	3	1095	Own.	4-4 1/2 x 5	4230	42x12	McCork-Deering.....	15-30	3	1250	Own.	4-4 1/2 x 6	5750	50x12	Yuba (Ball Tread)	25-40	8	4500	Own.	4-5 1/2 x 7	10130	48x17 1/2	
Case.....15-27	15-27	3-4	1350	Ow.	4-4 1/2 x 6	6600	52x14	Minneapolis.....	12-25	3	Own.	4-4 1/2 x 7	6600	56x12										
Case.....22-40	22-40	4-5	2650	Ow.	4-5 1/2 x 6 1/2	10700	56x16	Minneapolis.....	17-30	3-4	Own.	4-4 1/2 x 7	6400	54x12										
Case.....40-72	40-72	8-10	1900	Own.	4-7 x 8	21200	72x20	Minneapolis.....	22-44	4-5	Own.	4-6 x 7	12410	62x20										
Caterpillar.....2 Ton	15	3	Own.	4-4 1/2 x 5 1/2	4000		Minneapolis.....	35-70	8-10	Own.	4-7 1/2 x 9	22500	85x30											
Caterpillar.....5 Ton	25	4	Own.	4-4 1/2 x 6	9100		Moline (Un.).....D	9-8	2	725	Own.	4-3 1/2 x 5	4103	52x8										
Caterpillar.....10 Ton	40	6	Own.	4-6 1/2 x 7	20000		Moline (Orc.).....D	9-8	2-3	725	Own.	4-3 1/2 x 5	3893	44x8										
Cletrac.....F	9-16	2	815	Own.	4-3 1/4 x 4	1930	42x5 1/2	Monarch.....C	20-30	4	3800	Bea.	4-4 1/2 x 6	8700	66x12									
Cletrac.....W	12-20	2	1345	Own.	4-4 x 5 1/2	3455	48x 8	Monarch.....E	25-40	6	5000	Bea.	4-4 1/2 x 6	12000	67x12									
Eagle.....F	12-22	3	Own.	2-7 x 8	5850	48x12	Monarch.....D	35-60	6	6000	Bea.	6-4 1/2 x 6	15000	89x12										
E-B.....H	16-30	4	Own.	2-8 x 8	7100	48x12	Nichols-Shepard.....	20-42	4-6	2600	Own.	2-8 1/2 x 10	13500	64x20										
E-B.....AA	12-20	3	Own.	4-4 1/2 x 5	4550	54x12	Nichols-Shepard.....	25-50	6-8	3320	Own.	2-9 1/2 x 12	20500	69x28										
E-B.....Q	12-20	3	Own.	4-4 1/2 x 5	6500	60x12	Nichols-Shepard.....	35-70	8-12	10300	Own.	2-10 1/2 x 14	30000	73x32										
E-B.....16-32	16-32	4	Own.	4-5 1/2 x 7	9400	72x16	Pioneer.....G	18-36	4	Own.	4-5 1/2 x 6	6500	60x18											
Fagel.....19-12	19-12	2	1200	Ly...	4-3 1/2 x 5	3600	48x 8 1/2	Pioneer.....C	10-75	10	Own.	4-7 x 8	24000	96x24										
Fordson.....18	18	2	395	Own.	4-4 x 5	2562	42x12	Rumely OilPull.....	12-20	3	Own.	2-6 x 8	6882	51x12										
Frick.....12-20	12-20	2	1000	Er...	4-4 x 6	5800	60x10	Rumely OilPull.....	16-30	4	Own.	2-7 x 8 1/2	9600	56x16										
Frick.....15-28	15-28	3	1600	Bea.	4-4 1/2 x 6	6730	60x12	Rumely OilPull.....	20-40	6	Own.	2-8 x 10	12820	61x20										

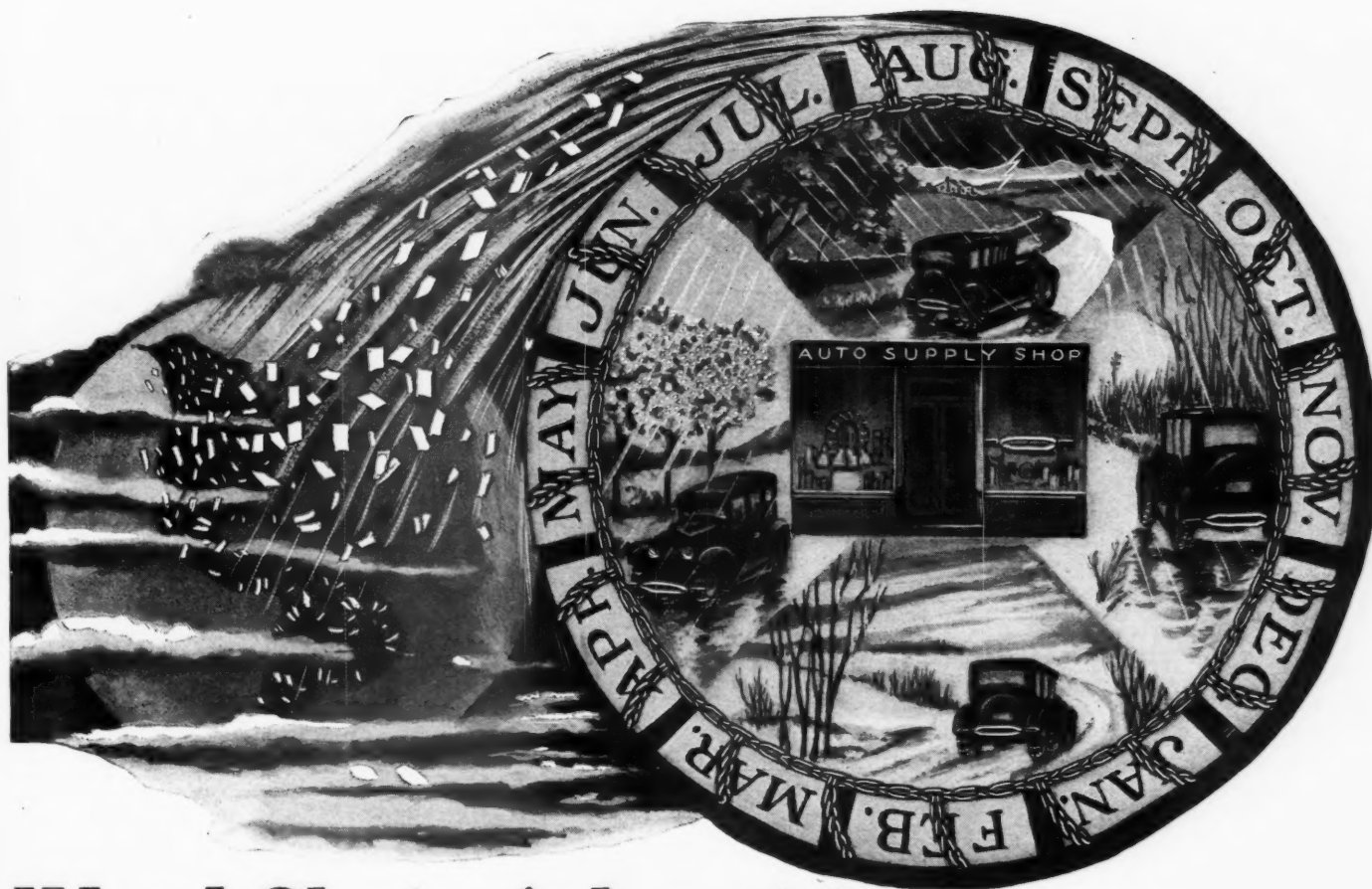
GARDEN TRACTORS																																																																																																														
Are.....F	3-6	1	\$385	Own.	1-4 1/2 x 5	1000	30x 4	Beeman.....Jr.	1 1/2-1	1	195	B&S.	1-2 1/2 x 2 1/2	210	30 x 3	Beeman.....K	1 1/2-4	1	265	Own.	1-3 1/4 x 4 1/2	550	25 1/2 x 3 1/2	Boles.....	1	180	B&S.	1-2 1/2 x 2 1/2	190	10 x 3	Centaur.....1923	2 1/2-5 1/2	1	345	N-W.	1-4 1/4 x 4 1/2	750	28x 4	Do-It-All.....(Jack)	2 1/2-6 1/2	1	395	Own.	1-3 3/4 x 3 1/2	750	Do-It-All.....(Baby)	2 1/2-6 1/2	1	495	Own.	1-3 3/4 x 3 1/2	1200	Do-It-All.....(Twins E)	2 1/2-6 1/2	1	495	Own.	2-3 3/4 x 3 1/2	800	32 x 4	Kinkade.....	2 1/2-6 1/2	1	190	Own.	1-3 3/4 x 3 1/2	180	22 1/2 x 5 1/2	M.B.M. Red.....E	1-4 1/2	1	250	Own.	1-3 3/4 x 4 1/2	410	20 x 3	Motor Macultrator	1	148	Own.	1-2 3/4 x 3 1/2	210	19 1/2 x 3 1/2	N.B.....2	6	1	375	Own.	2-2 3/4 x 4 1/2	750	32 x 4	Utilitor.....501	2 1/2-4 1/2	1	295	Own.	1-3 3/4 x 4 1/2	750	24 1/2 x 4 1/2	Utilitor.....501A	2 1/2-4 1/2	1	340	Own.	1-3 3/4 x 4 1/2	925	24 1/2 x 4 1/2

B&S—Briggs & Stratton
Ben—Bever
Bud—Buda

CH—Climax
Her—Hercules
LeR—LeRoi

Lye—Lycoming
Mid—Midwest
N-W—New Way

Ste—Stearns
Wau—Waukesha
Wei—We



Weed Chain Advertising Keeps At It All the Time!

THERE is no let-up in Weed Chain Advertising. We never plan a seasonal campaign of a few pages to persuade dealers to stock up. We are not merchandising our advertising. We merchandise Weed Chains. We use advertising to sell the consumer, and we keep at it all the time.

WHY? Because it pays us to sell the consumer month in and month out, and it pays those dealers who take advantage of our advertising. Some of them do their biggest business in Weed Chains in the summer and fall. How? They go after it when the other fellow is regulating his activities by the calendar.

Let us keep you supplied with Weed Chain advertising material, and always have it where it will catch the eye of the car-owner. Remind him that even in a dry spell he can never know when he may need Weed Chains.

"Ask 'Em to Buy" Weed Chains, "Use 'Em Yourself to Sell 'Em" and "Keep At It All The Time"!

AMERICAN CHAIN COMPANY, INC., Bridgeport, Connecticut

In Canada: DOMINION CHAIN COMPANY, LIMITED, Niagara Falls, Ontario

District Sales Offices:

Boston New York Pittsburgh Chicago Philadelphia San Francisco

THE WORLD'S LARGEST MANUFACTURERS OF CHAINS FOR ALL PURPOSES



Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES						Wheel Base (Ins.)	Tire Size (Ins.)†	NAME AND MODEL	ENGINE			ELECTRICAL SYSTEM		Clutch: Type and Make	Gearset Make	Universal: Type and Make	REAR AXLE		BRAKES: Service and Emergency	
OPEN MODELS			CLOSED MODELS						Make and Model	No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make				Ignition Make	Type and Make		Gear Ratio
2-3 Pass.	4-5 Pass.	6-7 Pass.	Sport Models	2-3 Pass.	4-5 Pass.	6-7 Pass.														
\$2385	\$1885	\$2385	\$2385e	3375	3075	124	32x4½	Kissel.....45	Own.....	6-3½x5½	26.38	Strom...	Remy..	Remy..	m-d War..	Warner..	m Spicer	F Own	3.92	R-R
5000	5000	5000	4200e	6300	6500	132	33x5	LaFayette.....	Own.....	8-3¼x5½	33.80	Johnson	Delco..	Delco..	m-d Own..	Own....	m Own..	F Own	4.58	R-R
1795	1795	1795	2145d	2345	2345	123	32x4½	Lexington.....23	Anst.....C	6-3¼x4½	25.35	Rayfield	G-D...	Conn...	m-d Own..	Warner..	f Sneed	F Own	5.10	R-T
1575	1395	1575	2055	2195	2645	117	32x4	Liberty.....10-D	Own.....	6-3½x5	23.44	Strom...	Wagner	Wagner	s-p B&B.	Detroit..	m Spicer	½F Tim	4.80	R-T
3800	3800e	3800	4600e	4900	4900	136	33x5	Lincoln.....	Own.....	8-3½x5	36.45	Strom...	Delco..	Delco..	m-d Own..	Own....	m Spicer	F Tim	4.58	R-R
8390	9500e	9600	11750	11600	12200	142	35x5	Locomobile...Series 8	Own.....	6-4½x5½	48.60	Ball&B.	West...	Delco..	m-d Own..	Own....	m Own..	F Own	3.85	R-R
3385	3185	3185	3385e	4385	4385	136	32x4½	Marmen.....34	Own.....	6-3¾x5½	33.75	Strom...	Delco..	Delco..	m-d Own..	Own....	m Spicer	¾F Own	4.10	R-R
885	885	885	975b	985	1235	109	31x4	Maxwell.....	Own.....	4-3¾x4½	21.03	Stewart.	Remy..	Remy..	c Own...	Own....	f Own..	½F Own	4.60	R-T
5400	5600	5700	6720	6600e	6810	140	33x5	McFarlan.....1923	Own.....	6-4½x6	48.60	Rayfield	West...	West...	m-d M&L	B-L....	m Peters	F Tim	3.75	R-R
3050b	3750e	3750e	3750e	4700	5250	132	32x4½	Mercer.....Series 5	Own.....	4-3¾x6½	22.50	Ball&B.	West...	Eisem...	m-d Own..	Own....	m Spicer	F Own	3.87	T-R
1295	1295	1295	1495d	1585e	1695	115	31x4	Mercer.....	Own.....	6-3¼x5	31.75	Strom...	West...	Eisem...	m-d Own..	Own....	m Spicer	¾F Tim	3.77	T-R
			1495d	1585e	1695	115	31x4	Moon.....6-40	Cont...6 Y	6-3½x4½	23.41	Strom...	Delco..	Delco..	s-p B&B.	Warner..	m Spicer	½F Tim	5.10	R-T
			1785	1995e	2485	128	32x4½	Moon.....6-58	Cont...8 R	6-3½x4½	27.31	Strom...	Delco..	Delco..	s-p B&B.	B-L....	m Spicer	½F Tim	5.09	R-R
			1995f	2585	2685	128	32x4½													
1240	1240	1390	1645e	2090	2190	121	33x4	Nash.....691-3-6-7	Own.....	6-3¼x5	25.35	Marvel.	Delco..	Delco..	s-p B&B.	Own....	m Own..	½F Own	4.50	R-T
915	935	1195d	1445	1890	2190	127	31x4½	Nash.....692-4-5-8	Own.....	6-3¼x5	25.35	Marvel.	Delco..	Delco..	s-p B&B.	Own....	m Own..	½F Own	4.90	R-T
			1195d	1445	1890	127	31x4½	Nash.....41-8	Own.....	1 3/8 x 5	18.23	Marvel.	Delco..	Delco..	s-p B&B.	Own....	m Own..	½F Own	1.88	R-T
2175	2475e	2375	2485d	3250	3785	130	32x4½	National.....BB	Own.....	6-3½x5½	29.40	Rayfield	West...	Delco..	s-p B&B.	B-L....	m Univ.	F Col.	1.08	R-R
2500	2500e	2600e	3250	3500	3785	128	33x5	Noma.....4C	Cont...8 R	6-3¾x4½	27.31	Zenith..	Delco..	Delco..	s-p B&B.	Detroit..	m Spicer	½F Tim	1.45	R-R
975	995	705g	1165e	1185	1515	115	32x4	Oakland.....6-44	Own.....	6-2½x4½	18.99	Marvel.	Remy..	Remy..	c Own...	Muncie..	m Mech.	F Own	4.70	R-R
975	975	1075e	1145a	1445	1595	115	32x4	Oldsmobile....43 A	Own.....	4-3½x5¼	21.86	Zenith..	Delco..	Delco..	s-p B&B.	Muncie..	m Own..	¾F Own	4.70	R-R
			1075e	1445	1595	115	32x4													
	1850e	1735	1675e	1875	2025	122	33x4½	Oldsmobile....46	Own.....	8-2½x4½	26.45	Ball&B.	Delco..	Delco..	c Own...	Muncie..	m Spicer	F Own	1.93	R-R
1625p	525	525	425e	705	860	115	32x4	Oldsmobile....47	Own.....	8-2½x4½	26.45	Johnson	Delco..	Delco..	s-p B&B.	Muncie..	m Own..	¾F Own	5.10	R-R
						100	30x3½	Overland.....91	Own.....	4-3¾x4	18.23	Till...	A-L...	A-L...	s-p B&B.	Own....	m Own..	½F Own	1.50	R-R
						106	30x3½	Overland.....92	Own.....	4-3¾x4	19.60	Till...	A-L...	A-L...	s-p B&B.	Own....	m Own..	½F Own	1.50	R-R
2485	2485	2685	2650e	3175e	3275	126	33x4½	Packard.....126	Own.....	6-3½x5	27.31	Own...	A-K...	Delco..	m-d Own..	Own....	m Spicer	½F Own	1.66	R-R
3850	3850	3850	4550e	4725	4700e	133	33x5	Packard.....133	Own.....	6-3½x5	27.31	Own...	A-K...	Delco..	m-d Own..	Own....	m Spicer	½F Own	1.66	R-R
2695	2450	2450	3235	3235	331	131	33x4½	Packard "Eight".....135	Own.....	8-3½x5	36.45	Own...	Dyneto.	Delco..	m-d Own..	Own....	m Spicer	½F Own	4.70	F-R
			3235	3235	331	131	33x4½	Packard "Eight".....143	Own.....	8-3½x5	36.45	Own...	Dyneto.	Delco..	m-d Own..	Own....	m Spicer	½F Own	4.70	F-R
			3435g	3435g	3435g	131	33x4½	Paige.....6-70	Own.....	6-3¾x5	33.75	Rayfield	Remy..	A-K...	m-d Long	Warner..	m Meen	½F Tim	4.60	R-R
1550	1390	1425	2395d	2395	3300d	120	32x4½	Peterson.....23-6-52	Cont...8 R	6-3¾x4½	27.31	Strom...	Delco..	Delco..	s-p B&B.	Durston..	m Hart.	½F Salis	4.50	R-R
3300	2990	2990	3300	4090	4390d	128	33x5	Peerless.....23	Own.....	8-3¼x5	33.80	Ball&B.	Delco..	Delco..	m-d Own..	Own....	m Spicer	½F Tim	4.90	R-R
5250	5250	5250	6900	6900	7000	138	33x5	Pierce-Arrow	Own.....	6-4 x 5½	38.40	Own...	Delco..	Delco..	m-d Own..	Own....	m Spicer	½F Own	4.20	R-R
	1695	1745	2445	2495	3385	126	32x4½	Pilot.....6-50	H-S... 90	6-3½x5½	25.35	Till...	Wagner	Wagner	s-p Hoos.	Muncie..	m Blood.	¾F Col.	4.67	R-R
2535	2535	2585d	2635d	3385	3585	126½	32x4½	Premier.....6-D	Own.....	6-3½x5½	27.34	Strom...	Delco..	Delco..	s-p B&B.	Own....	m Spicer	½F Own	4.58	R-R
	2850	2900	2850e	3500	3700	124	32x4½	R & V Knight...H	Own.....	6-3½x4½	29.40	Strom...	A-L...	A-L...	s-p B-L.	B-L....	m Spicer	½F Tim	5.40	R-R
	1335	1545d	1835e	1885d	2185f	120	32x4	Reo.....T6	Own.....	6-3½x5	24.34	Rayfield	N.E...	N.E...	s-p B-L.	B-L....	m Univ.	½F Own	4.70	R-R
			1835e	1835e	2185f	120	32x4													
3200e	3200	3200e	4000	4000	417	131	32x4½	Revere.....M	Dues....	6-4¾x6	30.63	Strom...	West...	Bosch.	m-d B-L.	B-L....	m Spicer	¾F Std	3.44	R-R
1485	1855	1985	1855e	1985	2135	117	32x4	Rickenbacker...B	Own.....	6-3¼x4½	23.41	Strom...	Bosch.	Bosch.	s-p Own.	Warner..	m Mech.	¾F Col.	4.63	R-R
1635	2035e	2135	2035e	2135	2135	117	32x4	Rickenbacker...B	Own.....	6-3¼x4½	23.44	Strom...	Bosch.	Bosch.	s-p Own.	Warner..	m Mech.	¾F Col.	4.63	F-T
2685	2485	2685	2750e	3285	3585	128	32x4½	Roamer.....6-54-E	Cont.12XD	6-3½x5¼	29.40	Strom...	West...	Split	s-p B&B.	G-L....	f Sneed	½F Tim	1.60	R-R
			3285	3585	3585	128	32x4½													
			3950f	4000f	4000f	138	32x4½	Roamer.....6-54-E	Cont.12XD	6-3½x5¼	29.40	Strom...	West...	Split	s-p B&B.	G-L....	f Sneed	½F Tim	1.60	R-R
3685	3485	3800	3650e	4250p	3950	128	32x4½	Roamer.....4-75-E	Roeh....	4-4¼x6	28.90	Strom...	West...	Split	m-d B-L.	B-L....	f Sneed	½F Tim	1.08	R-R
3785				4650p		128	32x4½													
10900	10900	10950	12800	12850	143½	33x5	Rolls-Royce....40-50	Own.....	6-4½x4½	48.60	Own...	Bijur..	Bosch.	c Own...	Own....	m Own..	F Own	3.70	R-R	
			13500	12900		118	32x4	Rubay.....	Own.....	4-2¾x5¼	12.10	Strom...	Bosch.	Bosch.	s-p Own.	Own....	m Univ.	F Own	5.10	F-R
			13500	12900		118	32x4													
1615	1615	2015d	2615	3100	5200	118	33x4	Sayers Six.....DP	Cont...8 R	6-3¾x1½	27.34	Strom...	Delco..	Delco..	s-p B&B.	G-L....	m Arvac.	½F Std.	4.75	R-R
875	875	2015d	2615	3100	5200	118	33x4	Seneca.....L-2 & O-2	Lyc...KB	4-3½x5	19.60	Zenith..	A-L...	A-L...	s-p B&B.	G-L....	m Univ.	F Peru	4.75	R-R
985	985	2500	2500e	3300	3400	127	34x4½	Seneca.....50c & 51c	Lyc...KB	4-3½x5	21.03	Zenith..	A-L...	A-L...	s-p B&B.	G-L....	m Univ.	F Peru	4.50	R-R
			3300	3400	3500	127	34x4½	Standard.....99	Own.....	8-3¼x5	33.80	Zenith..	West...	Split	s-p B&B.	G-L....	m Arvac.	½F Tim	4.45	R-R
2750	2750	2750	2425g	3585	3985	130	32x4½	Stanley.....740	Own.....	2-4 x 5	None...	Bijur..	None...	None...	None...	None...	None...	½F Own	1.50	R-R
319r	318r	285e	580	645	102	30x3½	Star.....	Cont. Spec	4-3¾x4½	15.63	Till...	A-L...	A-L...	s-p Own.	Warner..	m Spicer	½F Tim	4.87	R-R	
2250	2250	2450	2275e	3150	3450	125	34x4½	Stearns-Knight..SKL4	Own.....	4-3½x5½	22.50	Rayfield	West...	A-K...	m-d Own..	Own....	f Cli...	½F Tim	1.50	R-R
2700	2700	2850	2700e	3350e	4500f	130	3													



CADILLAC

It is perhaps true that the average purchaser of a Cadillac is not concerned, primarily, with its economy.

And for just that reason, as he drives the car year after year, he finds added cause for pleasure in his investment.

He discovers,—what veteran owners of the Cadillac have long realized—that its longevity, its constant, enduring performance, is the truest form of economy.

Because of Cadillac materials, Cadillac engineering and Cadillac craftsmanship, Type 61 lasts as long as an automobile can last, and

with reasonable care outlives two ordinary cars.

It is practicable to drive it throughout this long range of life, if one wishes, because even after years of service the Cadillac remains consistently fine and fashionable.

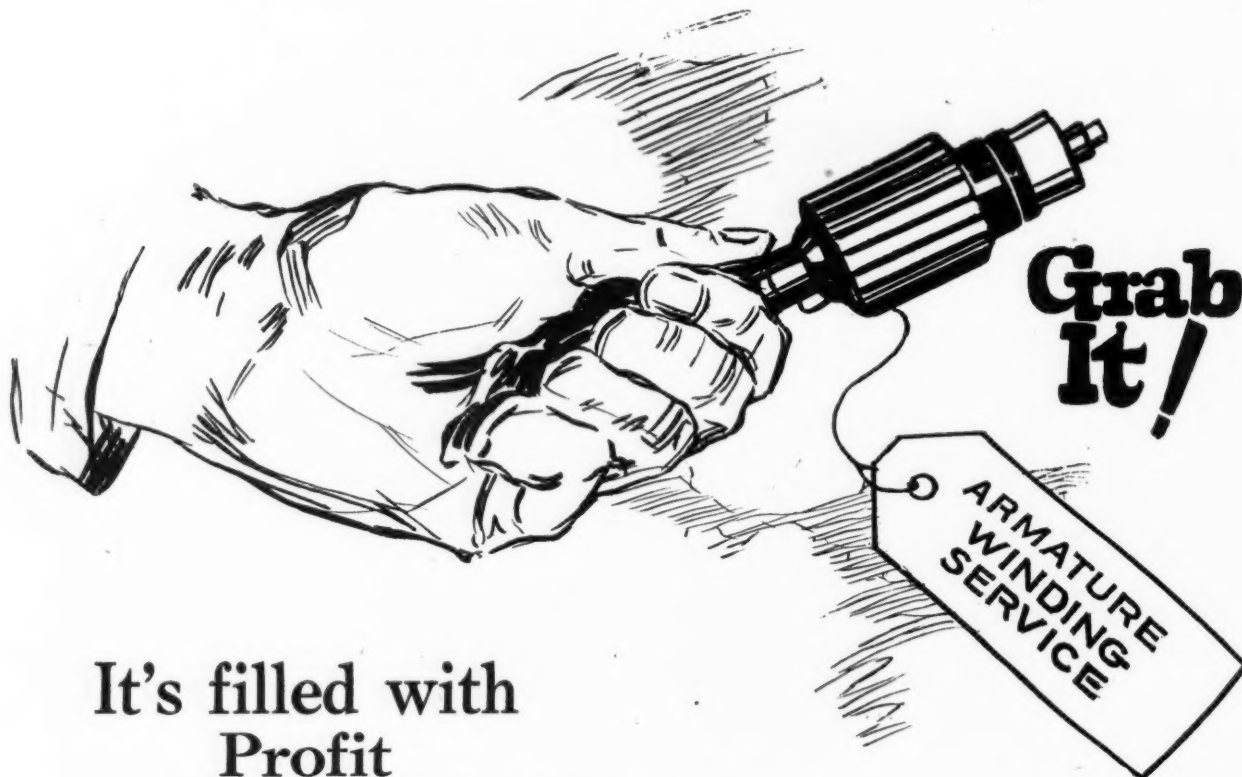
Moreover, daily operating costs are moderate, and Cadillac dependability is such that thrifty performance is a rule and even minor adjustments are a rarity.

Thus, four factors—freedom from repairs, high mileage at low cost, slow depreciation and unmatched resale value—are so well combined in the Cadillac that many consider it the most economical car.

CADILLAC MOTOR CAR COMPANY, DETROIT, MICHIGAN
Division of General Motors Corporation



Standard of the World



It's filled with Profit and Satisfied Customers

Just glance at that price list!

They are our prices to the trade—*TO YOU* on armature winding jobs—Do you see any prices that you could not make a very fair profit on?

Our service is unexcelled—We have a stock of rewind armatures and in practically all cases can exchange and ship the same day as received.

We Guarantee Every Armature We Rewind

You take no chances—We absolutely guarantee our material and workmanship which means satisfaction to you and satisfaction to your customers.

Try Us On Your Next Rewind Job

Just take bearings and end plates off and ship armatures to us Parcel Post or Express. We do the rest.

You'll appreciate our service once you've tried it. It saves you time and trouble and—IT PAYS. You'll be glad you "GRABBED IT."

Our business which is based on *service* has grown to such an extent, we are building a new plant which will give us a capacity of rewinding jobs of 1500 a day. Our present capacity is 300 a day.

PRICE LIST

Net Prices

Ford Generator Armatures	\$ 1.95
Ford Starter Armatures..	2.00
Any Make of Two Unit Generator Armature....	4.95
Any Make of Two Unit Starter Armature Rewound	6.75
Motor Generator	
Northeast	11.00
Simms Huff.....	7.00
Delco	12.00
Dyneto	12.00
Detroit	12.00
Any Vacuum Cleaner Armature	3.50

H. M. FREDERICKS CO.

Armature Winding Specialists

Lock Haven

Penna.

Sell Next Winter's Comfort Now

A LARGE majority of the automobile manufacturers, who are recognized as giving greatest value, are equipping their closed models with Perfection Heaters. Dealers who handle these cars are finding this feature a real sales aid.

It's a simple job for any car salesman to prove to prospective buyers the greater comfort of a Perfection Heater equipped car.

Perfection Heaters are widely recognized as the standard of value in heater equipment. If your cars do not come equipped with Perfection Heaters why not write your factory about this sales asset. Until your cars come equipped you can use this sales advantage by equipping your demonstrators and selling a heater when you sell a car. Many of the leading automobile dealers are doing this very thing.

Your jobber is prepared to serve you promptly.

The Perfection Heater & Manufacturing Co.
6545 Carnegie Avenue . . . Cleveland, Ohio

Manufactured in Canada by
Richards-Wilcox Canadian Co., Ltd.
London, Ont.



IMPORTANT



The real works of an automobile heater are hidden under the floor. You can't SEE the quality. The Perfection nameplate which is in plain view on every genuine Perfection Heater is just as much a protection to the dealer as it is to the car owner. If it isn't on the heaters in the closed cars you sell find out why.

PERFECTION MOTOR CAR HEATERS



The following manufacturers provide real winter driving comfort by equipping their closed models with Perfection Heaters without extra charge.

Auburn
Buick 4-Cylinder
Buick 6-Cylinder
Case
Cunningham
Davis
Dorris
Duesenberg
Durant-4

Durant-Fliat-6
Earl
Elcar
Fox
Gardner
Haynes
Henney-6
King
Kissel

Kline
Mercer
Meteor
McFarland-Special
Moon
Nash 4-Cylinder
Nash 6-Cylinder
National
Oakland

Paige
Pilot
Premier
R & V Knight
Standard "8"
Stevens
Stevens-Duryea
Studebaker
Stutz
Templar
Velle
Winton

Taxi Cab Equipment
Anchor Top & Body Co.
Barley Motor Car Co.
Elkhart Motor Co.
Premier Motor Corp.
Rauch & Lang, Inc.
Yellow Cab Mfg. Co.
Special Body Equipment
Chas. Abresch Co.
—Dodge Special
Lang Body Co.
—Dodge Special

REP

One year ago today I bought one of your trucks. It goes every day and every time we start it. It is a ton truck and our average load is fifty 49-lb. sacks of flour. Total expense, outside of gas and oil, has been for two punctures and two spark plugs.

There is nothing better, no matter what price and what test you put it to.

J. C. ROUSH,
*The Onawa Mills,
Onawa, Iowa*



Yellow Chassis

U B L I C *t r u c k s*



National Prestige for Each Local Dealer

WHATEVER the requirements of any truck prospect in your territory, there are hundreds, or thousands, of Republic trucks working profitably in that same line of business throughout the nation.

Whatever the roads, hills or traffic where you may sell Republic trucks, there are Republics working everywhere under all conditions to prove that nobody anywhere can go wrong on Republic transportation.

Republic is one of the few nationally distributed trucks, and dealers are coming to recognize that a truck must be backed by the broadest test—national use with national service. It means national prestige concentrated upon each local dealer!

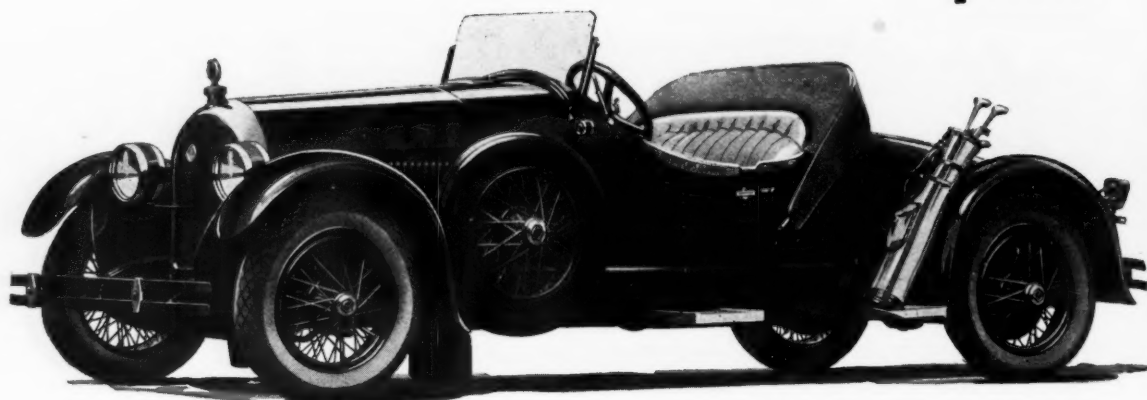
Republic strength today is not only in having more trucks in use than any other exclusive truck builder; but in nationally known Republic excellence; and in the virile and intimately experienced management now sweeping to renewed dominance. Dealers are alert to this trend. You should know about Republic possibilities near you.

REPUBLIC MOTOR TRUCK CO.
ALMA, MICHIGAN

More Trucks in Use than any other Exclusive Truck Builder

T r a n s p o r t a t i o n

**New
Speedster**



Leaders in the

The style leadership that has always been Kissel's is more firmly established in the new line of model "Fifty-five."

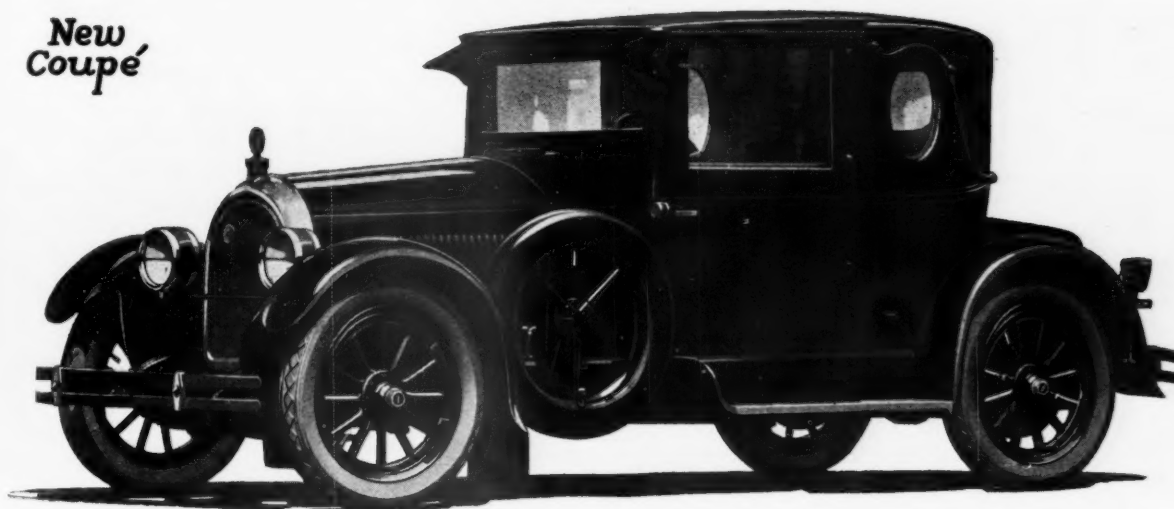
That statement will be admitted by automobile dealers who have watched the trend of fashion for the past ten years. Kissel has always been in the forefront of automobile styles; innovations made by Kissel in one year are widely copied in following years.

The new Speedster and Coupe just announced are splendid examples of the coach builder's art.

The Speedster has the racy, thoroughbred lines—refined and improved—that have made its predecessor famous and respected on every country road in America.

KISSEL

*New
Coupe*



New Season

The new Coupe is designed along Brougham body lines and embodies several innovations that will prove popular with the automobile buying public.

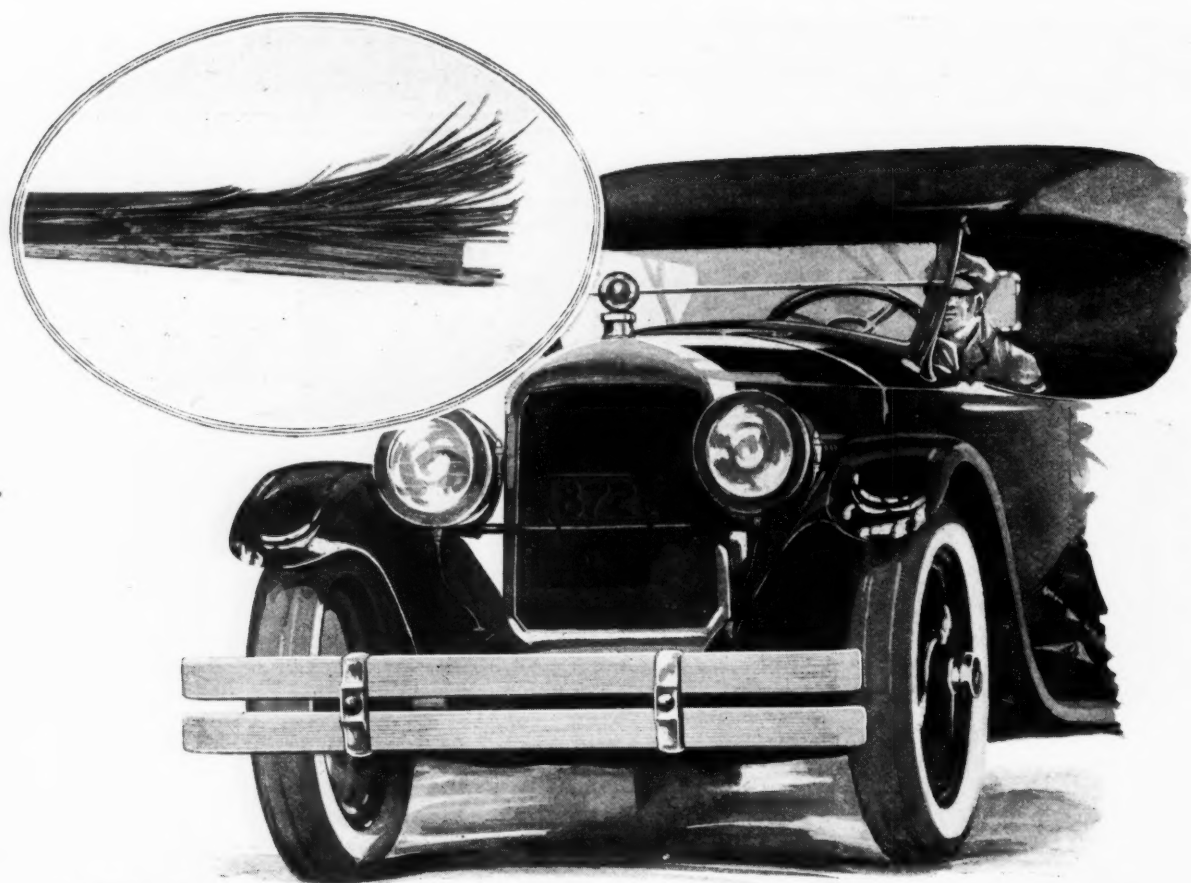
In the new model "Fifty-five," in fact, the entire Kissel line has been revised and improved without sacrificing one of the many exclusive Kissel features.

Dealers find Kissel a profitable line to handle. If there is no Kissel dealer in your territory, write or wire us for details of our attractive proposition.

The first and only car to make the famous Yosemite Valley run, officially sealed, in high gear

Kissel Motor Car Company
Hartford, Wisconsin

KISSEL



Fibrous Resiliency

THIS is the secret of the great strength of the Hays Hickory Hitter, a strength which makes our "A New Bumper Free If It Breaks" guarantee most logical.

Hickory is totally different from all metals in that it is composed of millions of individual, nature grown fibers, each of which has a strength and resiliency of its own. Each fiber offers an individual resistance to shocks. As a result, there can be no quick breaks as in over-tempered steel nor can there be any sharp bend as in under-tempered steel. Also temperature has no effect on the strength or resiliency of hickory—it being neither too pliable in summer nor too brittle in winter.

Note the photograph of the broken Hays Hickory Hitter bar in the oval insert. This bar was broken when the car to which it was attached collided with a train. See how the Hickory bar is torn and shredded and judge the tremendous resistance offered before it was finally broken through.

Not only do the hickory bars give this great strength and resiliency but because of them, Hays Hickory Hitters weigh

only about one-half as much as steel or iron bumpers, thus lessening greatly the wear on car and tires.

The balance of the Hays Hickory Hitter is entirely worthy of the fine straight grained, steam bent, hickory bars. Finest crucible steel springs, scientifically shaped and tempered, massive polished brass castings, which hold the bars always tight to the springs—and positive fittings for every make and model of car.

All this makes the Hays Hickory Hitter a bumper which we can successfully guarantee for the life of your car—a guarantee unequalled in the bumper field.

Dealers: There is no bumper which you can handle with so much satisfaction and profit as the Hays Hickory Hitter. It makes friends for itself and for dealers wherever it goes. One Hays Hickory Hitter on the street means fifty more sales. Write for catalogue and the name of our jobber in your territory, also for our contract plan of sales to dealers.

Jobbers: Desirable territory is still open. Write for details.

HAYS HICKORY HITTER

Guaranteed for life of your car

Double Bar Type
\$18.00

Weights 27 pounds

"Junior" Double Bar Type
\$15.50

Weights 20 pounds

Single Bar Type
\$12.50

Weights 18 pounds

The "Junior" is a double bar type Hays Hickory Hitter made especially for Fords, Chevrolets, Star Cars, etc.

J. M. Hays Wood Products Company

A Division of the Standard Crate & Filler Co.

JEFFERSON CITY, MO.

MORE asbestos and solid weave give to GARCO those extra miles of service which make the GARCO reputation



The GARCO reputation, plus safety, means satisfied customers and larger profits

RINGPAK—the Perfect Piston Seal Stops the Leaks

GENERAL ASBESTOS & RUBBER CO.

Main Offices and Factories:
Charleston, S. C.

Branches:
New York, 299 Broadway
Chicago, 14 North Franklin St.
Pittsburgh, 311 Water St.

Canadian Distributors:
Canadian Asbestos Co., Montreal, Can.

FEDERAL

Automotive Rubber Accessories



Defender Emergency Patch

An inside sleeve of unusual quality with outside layers of highest quality fabric, inside composition of shredded Cord Fabric interwoven in a compound of special heat-and-strain resisting rubber stock. This sleeve is of equal thickness throughout. Its greatest strength does not lie within a few square inches in center of patch, as in the case of ordinary built up fabric patches. It is not a "filled" patch. The result—an unusually strong sleeve at a moderate price.

Finished with tapered feather edge and soft red rubber tip which avoids injury to tube.

Para-Tite Quick Repair Kit

In Para-Tite we have what is considered the best cold tube-patch that can be procured. In fact it is an All-Rubber Repair Patch conveniently packed for repairing all kinds of Rubber Goods, especially Automobile Tubes. Unusually strong and tenaciously adhesive, it is packed 36 square inches in each can, with more than sufficient cement to cover this liberal amount of material. It stands in a class by itself.



Para-Tite Display Stand

THIS ATTRACTIVE COUNTER DISPLAY STAND FREE. With each order for Para-Tite, we include the attractive display stand shown in the illustration at the left. Prominently displayed on showcase, counter or shelf, this "silent salesman" will aid very materially in making sales.

FEDERAL AUTOMOTIVE RUBBER ACCESSORIES SOLD THROUGH
WHOLESALE JOBBERS ONLY

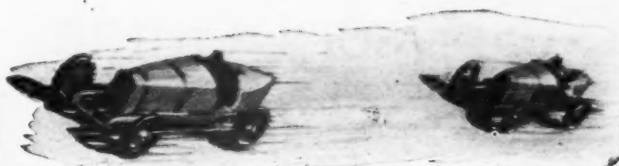
THE FEDERAL RUBBER COMPANY

OF ILLINOIS

FACTORIES—CUDAHY, WISCONSIN

Where Good Wrenches Are Essential

—in the racing pits



Here is the way famous racing drivers and their mechanics write about "CV" wrenches:

"I would not be without a set of "CV" Wrenches. *Chrome-Vanadium* is used quite extensively in the construction of racing cars on account of its strength and dependability, and it makes wrenches that give wonderful service."

Eddie Heame

"The Bonney *Chrome-Vanadium* Wrenches have proven very satisfactory. After hard, continuous use, they show no signs of spreading or nicking in the jaws."

Earl Cooper

"*Chrome-Vanadium* makes a wrench that can be depended upon to stand up under the hardest kind of service. The shape of this wrench, with its deep jaws and long points, appeals to me as the ideal wrench."

Harland Fenger

"Just now I happen to be overhauling Jimmy Murphy's car in preparation for our European trip. I am very favorably impressed with the quality and workmanship of your Bonney "CV" wrenches and confidently expect to use them for a long time."

Einie Olson.

Made in U. S. A. by
**BONNEY FORGE
AND TOOL WORKS**
Allentown, Pa.

Also
"Only the Best"
Carbon Steel Engineer
Wrenches
Stillson Pipe Wrenches
Adjustable Wrenches
Combination Wrenches
Lehigh, Garage and
Standard Vises
Battery and Slip Joint
Pliers
Drop Forgings—
Capacity Million
Monthly



More than
twice as
strong as
carbon steel

These wrenches are guaranteed to strip the thread of any standard or S. A. E. nut or break the bolt before the jaws will spread. *Chrome-Vanadium* permits a head as thin as 5/32 on the tappet wrench—a huge advantage.

Catalog No. 23 fully explains the Bonney "CV" Line.
Write for it today.

BONNEY

Chrome-**CV**-Vanadium
WRENCHES



Going to Get a Real Cylinder Grinder?

Let LANDIS Users Guide You in Your Selection

No better guide can be found for intending buyers than the advice of the actual users of a piece of equipment. We quote a few paragraphs from the kind of letters we are receiving all the while.

"Due to the accuracy and finish of cylinders obtained by this machine, we have been able to increase our business over 50 per cent."

"We wish to state most emphatically that we do not believe it possible to build a machine to do more perfect work."

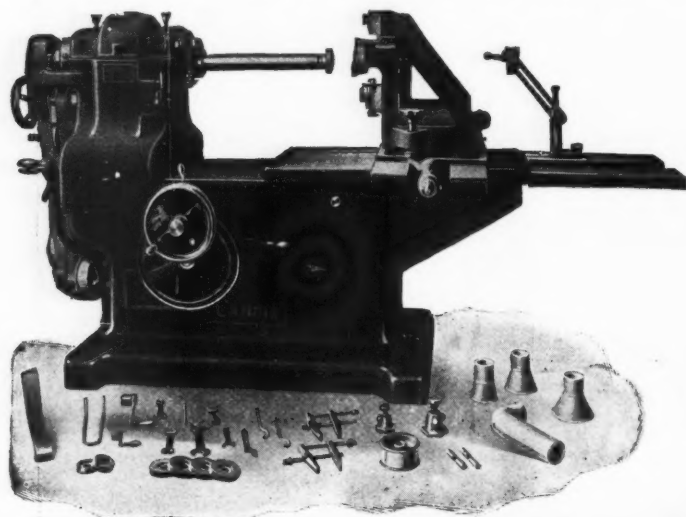
"We have had experience with both the and the machines, and can safely say that in our jobbing work in competition with either of these makes, we would only be satisfied with first place."

"You will probably recall that we ourselves erected this machine and had it in operation before your representative could get here—we cite this to show our appreciation of its simplicity."

"We would like to take this occasion to say that we have found the Landis Tool Co. always ready to respond to any and every request we have made, and we consider them mighty nice people to do business with. We believe you will have no regrets if you install a Landis Grinder."

Make sure you select a cylinder grinder about which you can talk with such enthusiasm.

Get a Landis quotation—and see how much money you save.



LANDIS TOOL CO.

Waynesboro, Pa.

New York Office—51 Chambers St.

LANDIS



Get the Truck Trade

Build sales volume by going after the truck trade. The dry and cleaned gasoline you can sell with a Bowser Sentry pump, assures most miles per gasoline dollar—tends to keep down carbon and eliminate carburetor trouble—brings trucks back!

Stop the trucks that pass your door. Ask for folder A-14 and our sales folks will tell you how to sell more gasoline and oil—particularly oil!

S.F. BOWSER & COMPANY, Inc.

Pump and Tank Headquarters

FORT WAYNE, INDIANA.

Sales and Service Offices and Representatives Everywhere

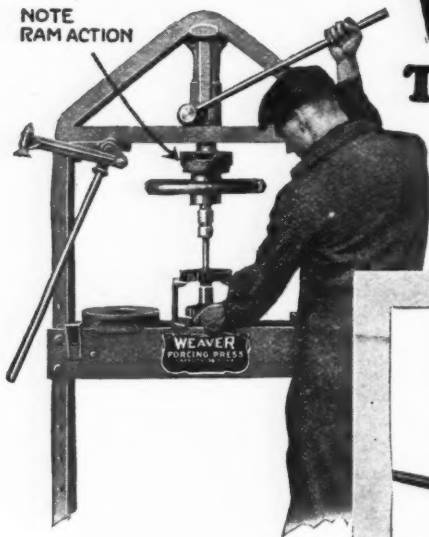
TANKS DEPENDABLE PUMPS



WEAVER **HI-SPEED** Press

Two essential garage presses in one

NOTE
RAM ACTION



A sensitive speedy press for light work

For handling the numerous jobs that come up daily requiring pressure up to 2,000 lbs. the Hi-Speed rack and pinion lever is of great advantage, as shown in the above cut, owing to its superior speed. It is also specially useful on delicate work, since the operator can feel when sufficient leverage has been applied. In a word, it affords all the advantages of a separate rack-and-pinion press, without the additional cost.

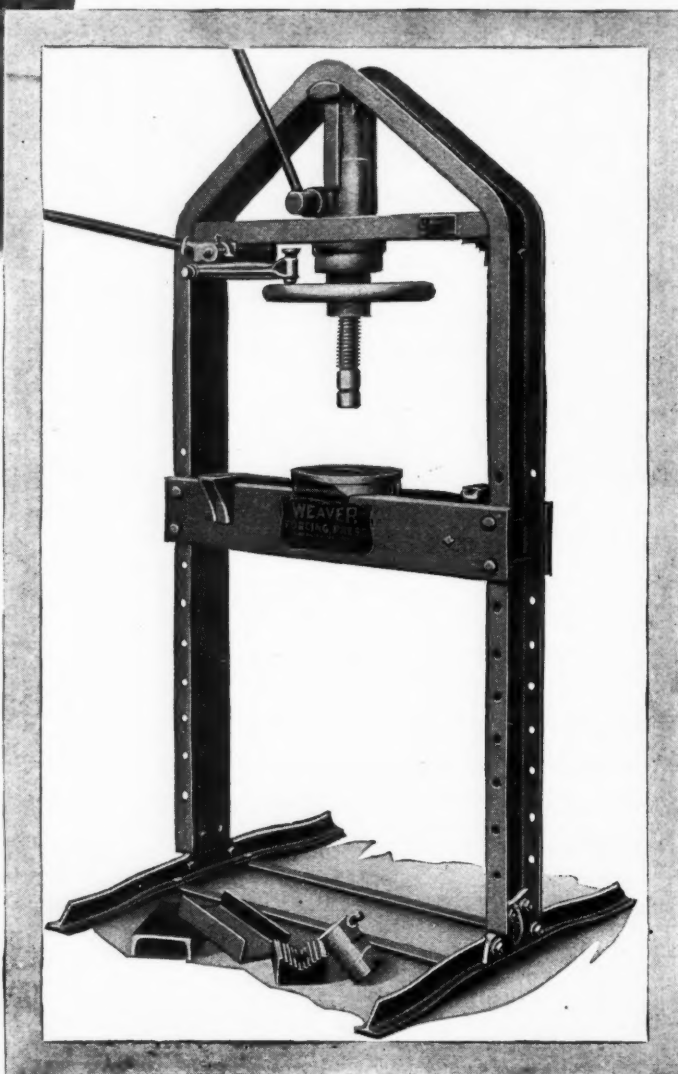
THE new Weaver Hi-Speed Press is really two presses in one—a heavy duty screw press for work requiring extreme pressure and a speedy, sensitive press for light pressure jobs. And with this outstanding time and labor saving advantage—once

the work is under the press screw you can exert any degree of pressure needed without having to move it to a separate press. You effect a big savings, too, because you pay for one press instead of two.

A powerful press for heavy work

When a job requiring extreme pressure is to be handled, the screw can be quickly spun down in contact with the work by means of the ball bearing hand wheel, and the ratchet lever thrown into engagement, as shown in the cut below. Two adjustments provide leverages of 1,500 to 1 and 3,000 to 1, permitting the operator to exert pressure up to over 28 tons with ease.

Note that the space within the one piece steel frame is unobstructed the entire height of the press, permitting bulky work to be easily handled, and that the screw is *always directly in contact with the work, no matter how small the work may be.*



Hi-Speed Attachment for Regular Weaver Presses in Service

The Hi-Speed feature described above can now be had as a separate attachment, enabling owners of Weaver Regular Presses to convert them into the new Hi-Speed type and enjoy its many advantages at a slight cost.

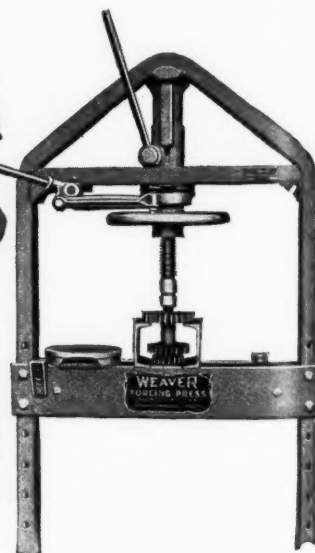
Write for Details

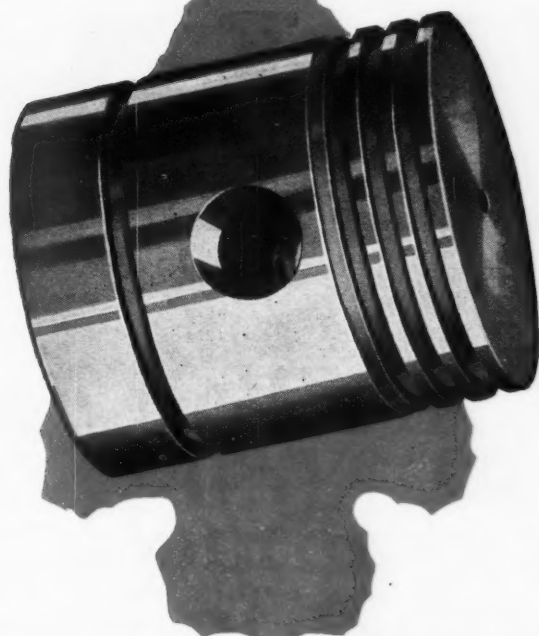


WEAVER MFG. CO.
Springfield, Illinois, U. S. A.

WEAVER CANADIAN CO., Ltd.,
Chatham, Ontario.

The Best Equipped Shop Gets the Business



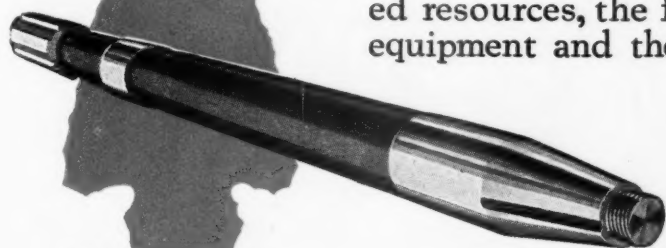


You Can Be Sure of Arrow Head Pistons

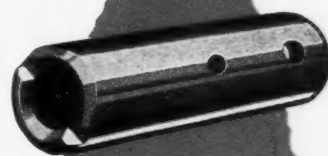
EACH type of Arrow Head grey iron Piston has its own individual jigs and fixtures. Heat treated for 24 hours in specially designed furnaces.

The pin holes always line up and are square with the wall. There is no variation of wall thickness. Dimensions are accurate.

Arrow Head Pistons, Piston Pins, Axle and Drive Shafts represent Quality that can only be reached with unlimited resources, the finest material and equipment and the highest standard of manufacture.



ARROW HEAD
STEEL PRODUCTS CO.
MINNEAPOLIS, MINNESOTA

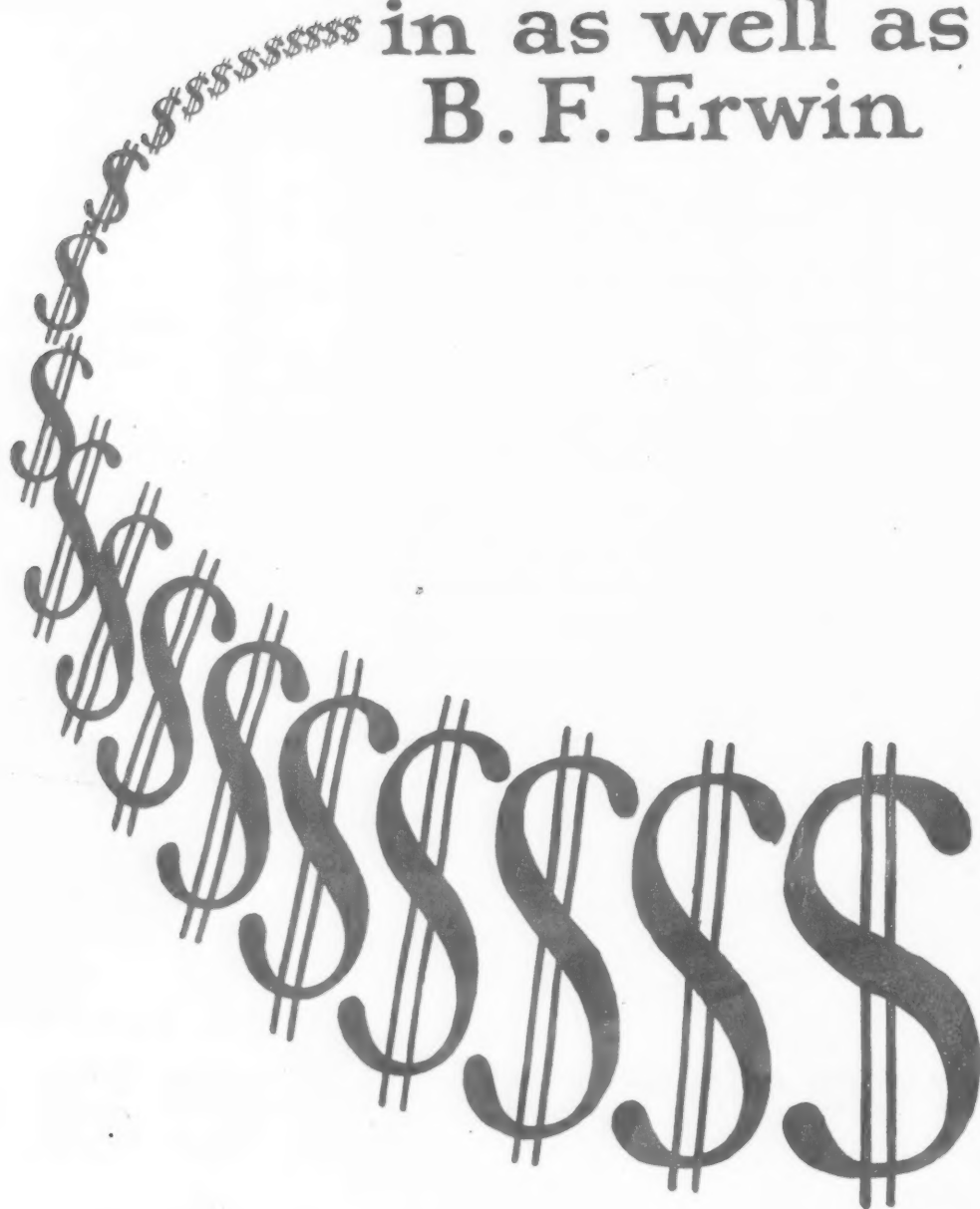


Arrow Head Products

The "Arrow Head" is Your Guarantee

WILLYS-

Are You cashing
in as well as
B. F. Erwin



OVERLAND

69 cars sold and
delivered in
Six Months in a
town of 1500
population~~

That is the way B.F. Erwin,
the Willys-Overland dealer
in Winter Haven, Florida, is
piling up profits~

Write or wire for
Franchise Proposition

Willys-Overland Inc., Toledo, O.

Willys-Overland Ltd. Toronto, Ont.



A Low Price for Real Quality

MAKE a friend when you sell a low-price tire. The Fisk Premier Cord will do just that for you.

This attractive, clean-cut cord is a typical Fisk product, sells at a low price that will satisfy the man who wants a low-price tire, and will bring him back again to buy another when he needs one.

No dealer who wants to stay in business and make a profit will willingly handle an unknown tire, built only to sell at a price, if he can sell a good tire of known value at the required low figure.

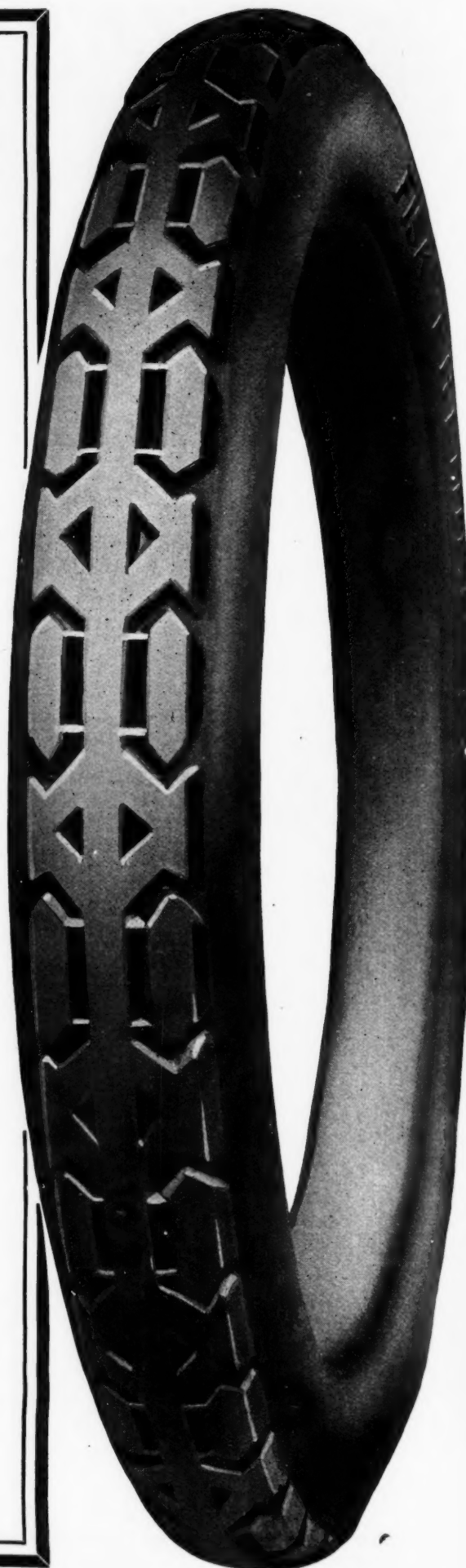
You can be sure of the Fisk Premier Cord. It is built to sustain the Fisk reputation, and, as in all Fisk Tires, it delivers service at a new low cost per mile.

Increase your turnover—get bigger volume. You can do both with this good tire—and it will build your reputation, too.

*There's a Fisk Tire of extra value
for every car, truck or speed wagon.*



THE FISK TIRE COMPANY
INCORPORATED
Chicopee Falls, Mass.

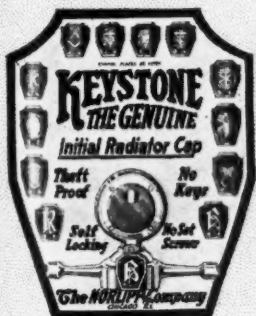


Introducing The New —

KEYSTONE JUNIOR



Our Display Pedestal supported by Keystone Jim, who is one of the busiest characters in the United States. Jim's business is to sell Keystone Caps—Let him work for you.



Many dealers, throughout the country, have boosted Keystone sales by the use of the Initial and Emblem card—It is a counter display that sells.



This window display (Actual size 29-in. x 40-in.) is attractively lithographed in four colors.



The

Genuine

Initial Radiator Cap

for FORD, STAR, CHEVROLET,
GRAY and OVERLAND Cars

Also fits Dodge, Willys-Knight, Rickenbacker, Cleveland and Maxwell cars. The Keystone Senior model fits all threaded radiator necks.

The New Keystone Initial Radiator Cap is without steel parts and is "absolutely rust-proof." The machine-set brass insert cannot be removed from the cap—once put on a car "it stays put," stays sold, never requires any service and will outlast the life of the car.

The keystone shaped initial and emblem plates are standard and fit both Junior and Senior models.

Keystone Radiator Caps are the best made or ever will be made, because they are the "last word" in cap construction and will do everything a "good" radiator cap should do.

*Theft-proof • Rust-Proof • Ornamental
Easy to attach • Water and steam tight • Attractive in design
Protects motor meter • Any initial or emblem*

All Keystone Caps have a hinged cover to permit filling of radiator—no turning or removing of cap is necessary. On the Senior model the hinged cover is held tight to cap by means of a threaded thumb screw—Junior models with a spring clasp. Keystone Caps are standard merchandise and dealers not stocking this line are overlooking profitable business. In case your jobber cannot supply you write us direct.

Price \$3.50 Without Initial or Emblem

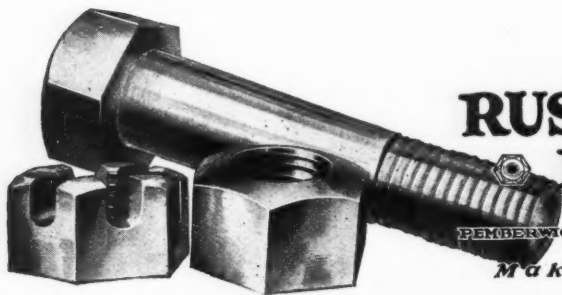
The Norlipp Company
568 West Congress Street
CHICAGO

THOMAS FOX
 Started July 17, 1872
51 Years
 With Russell, Burdsall & Ward



A Significant Fact
 The "more-than-
 thirty-years" honor
 roll at the Russell,
 Burdsall & Ward
 plants now con-
 tains 82 names

LOYALTY means devotion. And that is the basis of all good work. We are just as proud of this quality in our employees as of the quality they put into EMPIRE bolts—for one is at the root of the other.

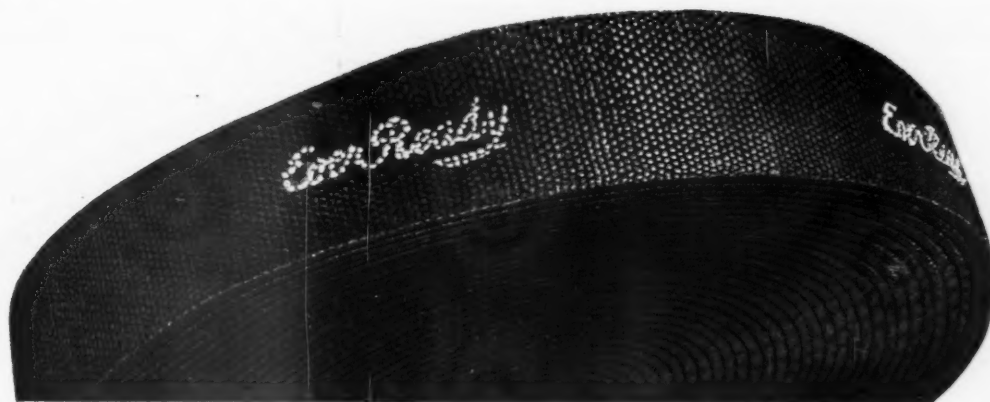


RUSSELL, BURDSALL & WARD
BOLT & NUT COMPANY 
PORT CHESTER, N.Y.

PEMBERTON, CONN. • CHICAGO • SAN FRANCISCO • ROCK FALLS, ILL.

Makers of Bolts, Nuts and Rivets Since 1845

EMPIRE BOLTS



We Believe—

**That Kelso EverReady Is the Most
Carefully Made Brake Lining
on the Market Today**

WE believe the distributor who handles it — the dealer who stocks it—the motorist who buys it, will all profit by choosing Kelso EverReady.

EverReady braking efficiency and lasting qualities have been proven again and again in the extremes of service when performance not price have been the deciding factor.

In fact—

Service tests in competition with other brake linings have done more to build Kelso EverReady reputation than any other factor. Distributors and dealers who take pride in handling quality products will be interested in hearing the full story of Kelso EverReady—

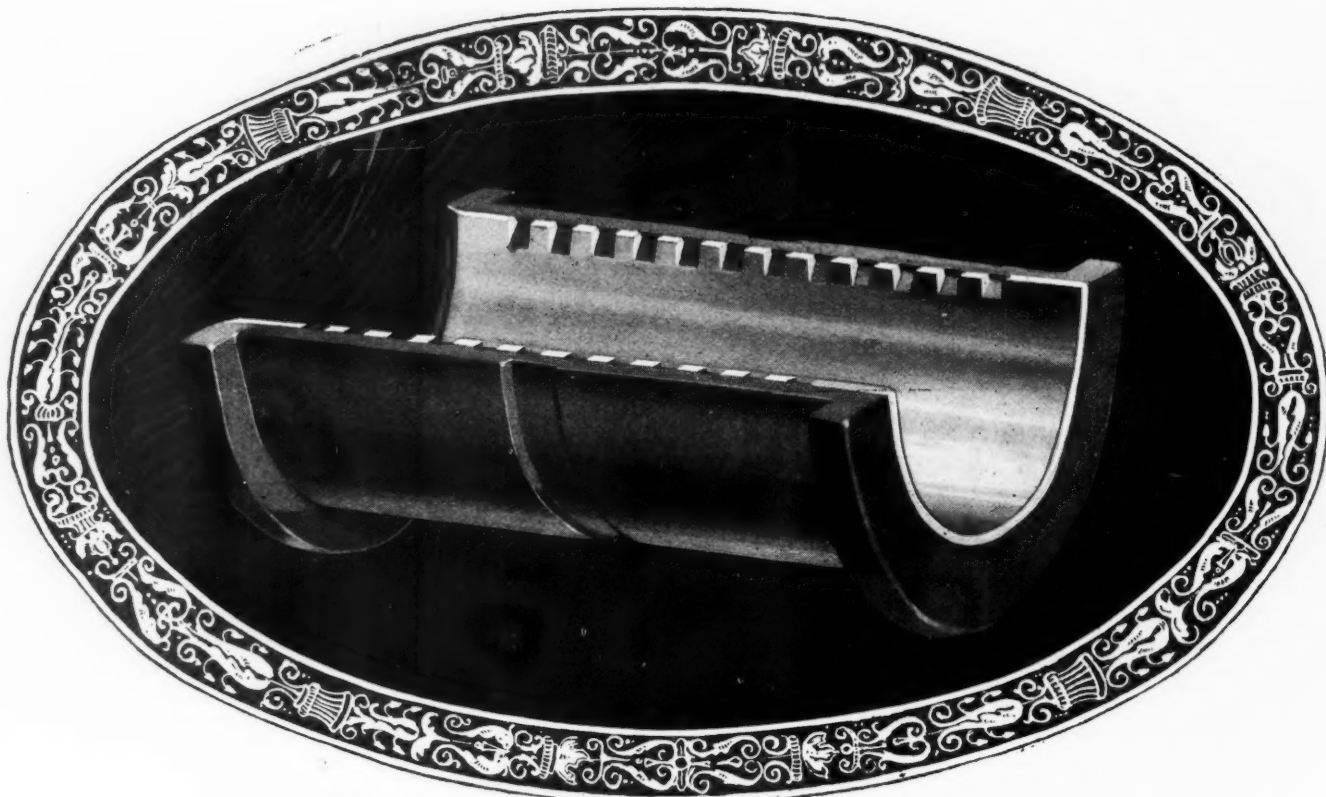
“the most carefully made brake lining on the market to-day.”

KELSO MFG. CO.
Trenton, N. J.

Kelso EverReady

BRAKE LINING

& Clutch Facings



Mogul and the "Caterpillar"

It is generally admitted that tractor service is about the most difficult test to which engine bearings can be put. A tractor motor runs under heavy load and at high speeds for a very large percentage of the time.

The bearing test is particularly severe on the famous Holt "Caterpillar" 2-ton Tractor, because this tractor is built for and used in the most difficult forms of service, from breaking the prairie lands in the West to bucking snow-drifts for the street cleaning department in New York City.

The strongest evidence of the confidence held by the Holt Company in the superiority of Mogul Bearings is borne out by the fact that Mogul Bearings are produced in Detroit, 3300 miles away from the Holt plant, at Stockton, California.

MUZZY-LYON COMPANY, DETROIT, MICH.

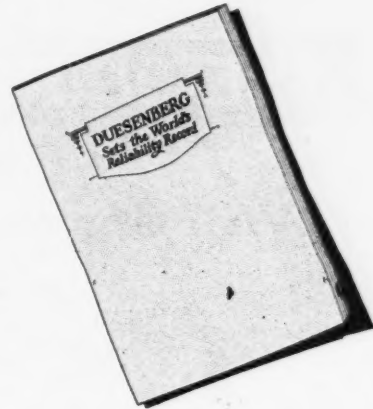


Mogul

Engine Bearings and Bearing Alloys

THE Duesenberg non-engine-stop run of 3155 miles (50 hours 21 min.,) at a speed of 62.63 miles per hour was recognized as an epoch marking record. It conclusively proved that this perfectly designed straight eight engine is made right to give maximum service. Could an engine of less perfect design and balance endure such a continuous fifty hour run?

The A. A. A. technical men in charge of the run and tear-down of the car found no damage to it, the engine, bearings or other parts. Long ago Duesenberg theories of design and construction passed the experimental stage. For more than two years the perfected original straight eight has been in the hands of owners. Repeat orders prove that these cars satisfy even the high ideals of Duesenberg buyers.



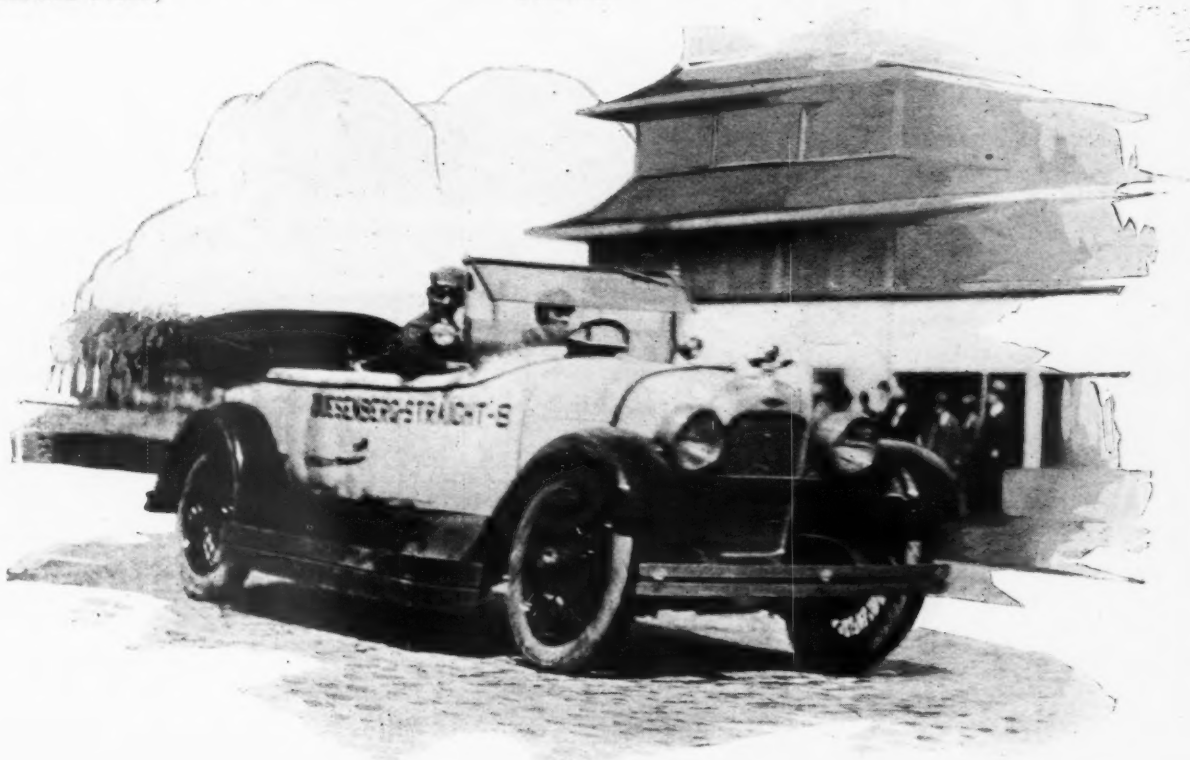
Fully illustrated booklet describing this record-breaking run will be sent on request.

DUESENBERG

*The Original Straight-Eight
With Four Wheel HYDRAULIC Brakes*

INDIANAPOLIS,

U. S. A.

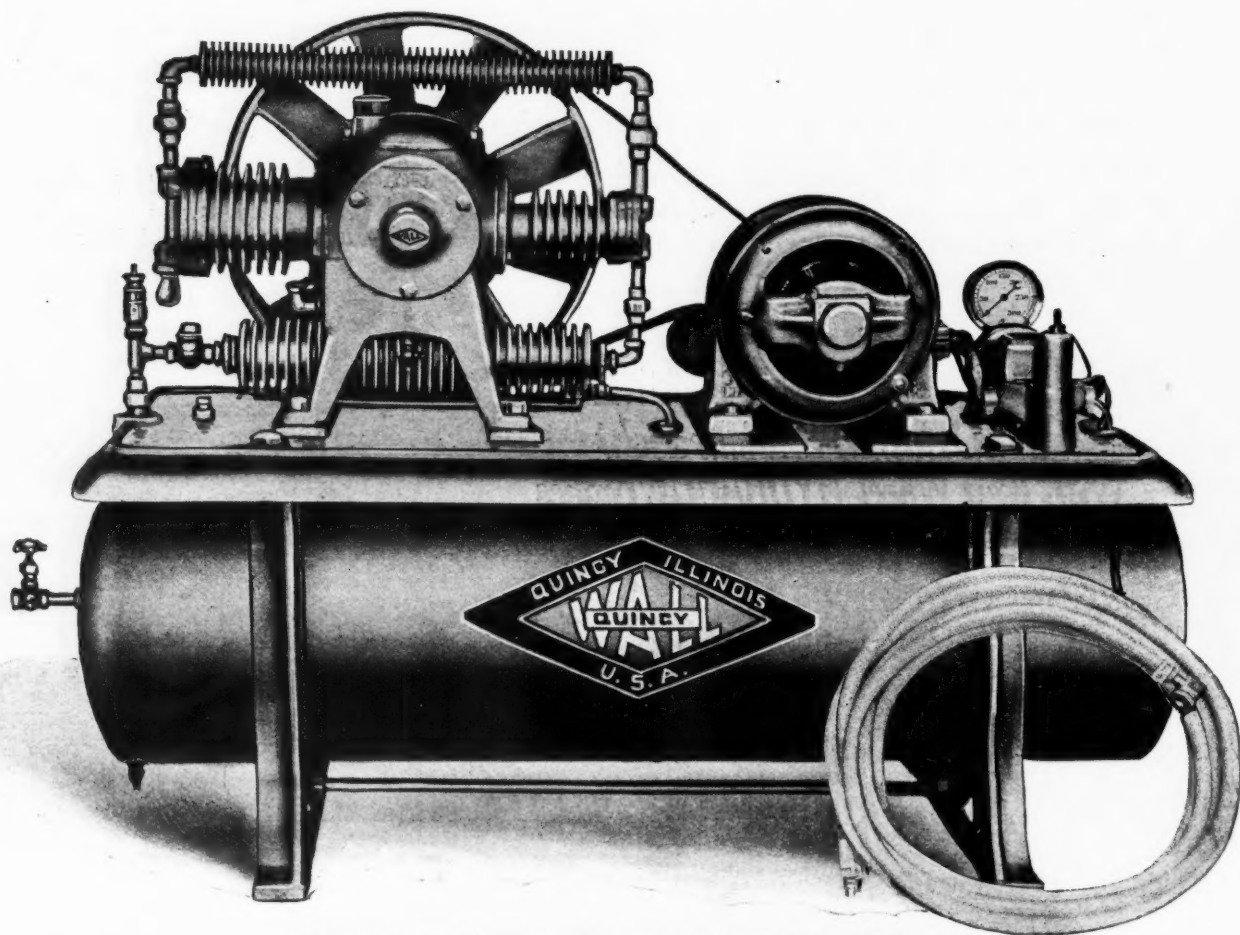


**WHY
LOAD YOUR BUSINESS DOWN
WITH POOR AND COSTLY AIR-SERVICE?
WHEN**

THE QUINCY SILENT AIR-MASTER

Made in Quincy, Illinois, U. S. A.

Will Serve You Better at Lower Cost



Model G-16 Two-Stage Automatic Unit

THE MASTER OF DEPENDABLE FREE AIR SERVICE

Silent in Operation—Free of Vibration—Long Life
An Advanced Step In Air Compressor Construction

WRITE TODAY FOR CATALOG AND FULL INFORMATION

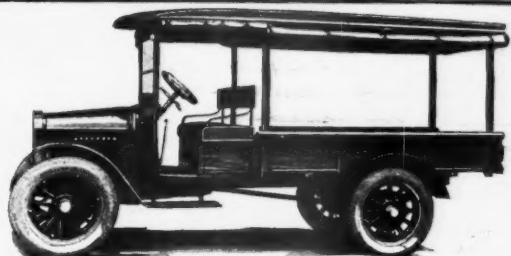
Some good territory still open for live agents and dealers

WALL PUMP & COMPRESSOR COMPANY

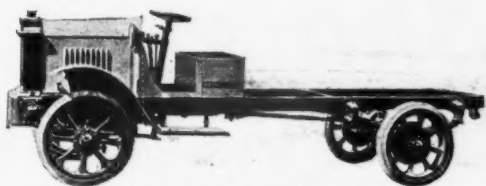
217 Maine Street, Quincy, Illinois, U. S. A.

SPECIALIZING IN TWO-STAGE AND SINGLE-STAGE AIR COMPRESSORS AND VACUUM PUMPS

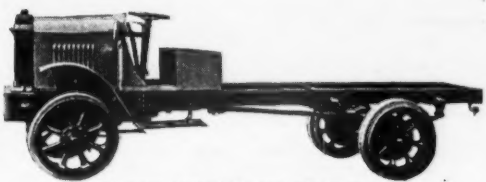
The New BETHLEHEM



"Airline" 1-ton, \$1385.00
(chassis)



"Fast Freight" 2-ton, \$2185.00
(chassis)



"Heavy Duty" 3-ton, \$2985.00
(chassis)

THE CONTRACT

With a substantial new Corporation in business to stay.

Every contract direct with the factory. Perpetual—automatically renewable year after year.

Maximum discount to all.

Contract Deposit One Dollar.

Factory floor plan.

92½ % immediate cash return retail deferred payment plan.

District Sales Managers coast to coast.

THE PRODUCT

Magazine and high pressure chassis lubrication—less attention from the driver—a perfectly lubricated truck.

Bethlehem's own motor.

Electric lighting and starting equipment all models.

Bosch AT truck magneto.

Spiral bevel (Eaton) and double reduction rear axles.

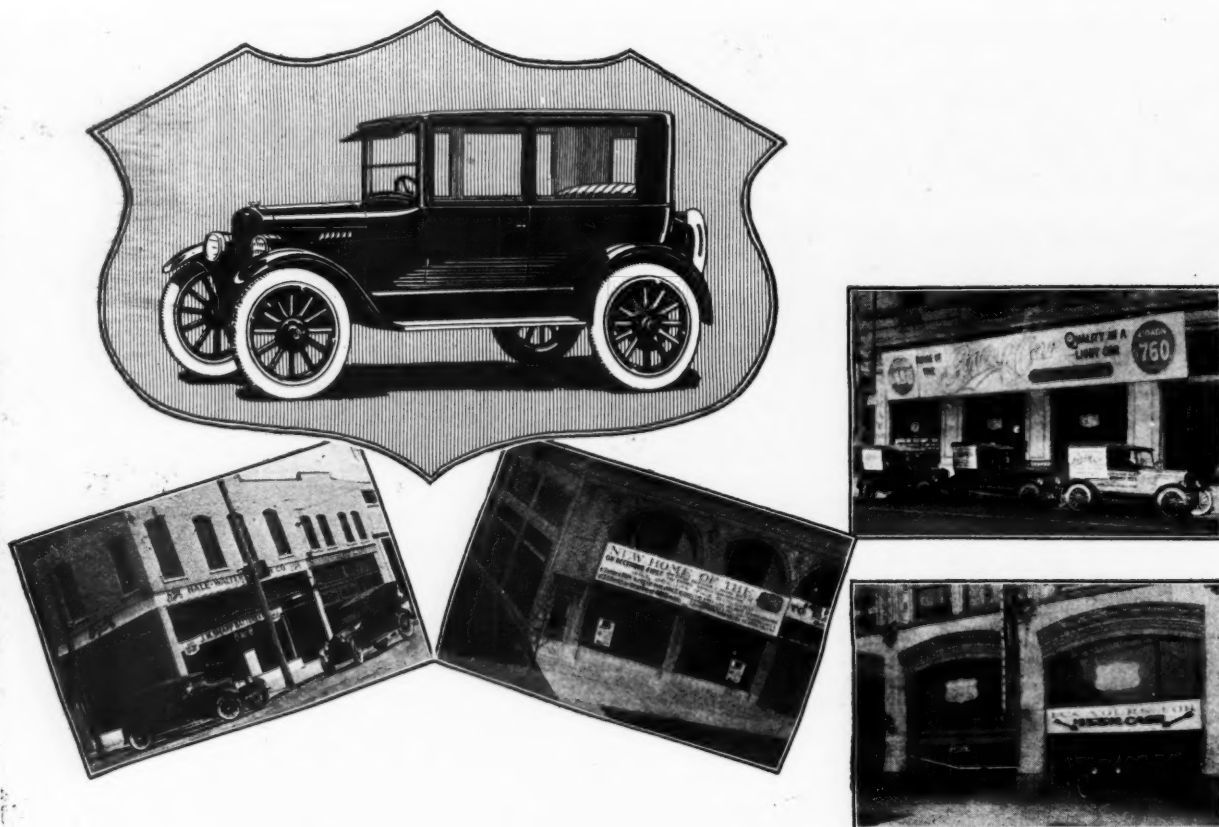
All types of bodies—made in Bethlehem shops.

Not just another truck—"ALL A MOTOR TRUCK SHOULD BE".

THE NEW
BETHLEHEM MOTORS CORPORATION
OF NEW YORK

ALLENTOWN

PENNSYLVANIA



Share Gray Success

The story of Gray Car success is an unusual one.

In one short year Gray has attained the three requisites of automobile success, public favor, quantity production and nation-wide distribution.

The Gray Car has distinctive features which appeal to a motor-wise public. Its simplicity and economy have surprised the wisest of automobile engineers. Gray holds the world's official economy record.

Gray bodies, particularly in the Closed Cars, are exceptionally well built and most completely equipped.

The Gray line therefore holds all the elements of a profitable line and you can round out your present sales and increase your profits with the addition, a Gray franchise.

GRAY MOTOR CORPORATION
DETROIT, MICHIGAN



Save 1/3 the Gas

There may be open Gray territory near you. Write or wire us for details of Gray sales opportunities.

Gray Prices at Detroit

Roadster - \$490	Touring - \$520	Coupe - \$685
Coach - \$785	4-Door Sedan \$835	Truck - \$575



BADGER

Passenger Car - Commercial Car

TIRES

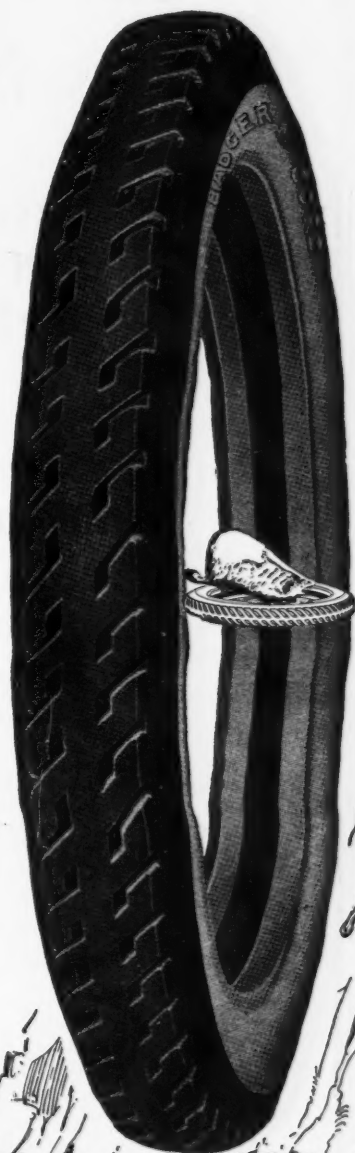
Reports from leading Jobbing Houses indicate a steadily-increasing volume on BADGER TIRES.

A Boston house writes—"We have practically trebled on sales over 1922" and further adds, that "the BADGER line, its policy and advertising program have won the enthusiasm of our entire organization".

Similar favorable reports come from other parts of the country—all indicating the desirability of BADGER as a competitive, permanent, profitable line.

Dealer Trade supplied through accredited Jobbers everywhere.

THE BADGER RUBBER WORKS
Milwaukee, Wisconsin



The Sterling-Knight is a finished car—no experimental work has been left for the dealer

Three years of experimentation and development have been built into the Sterling-Knight. It is a tested, finished product.

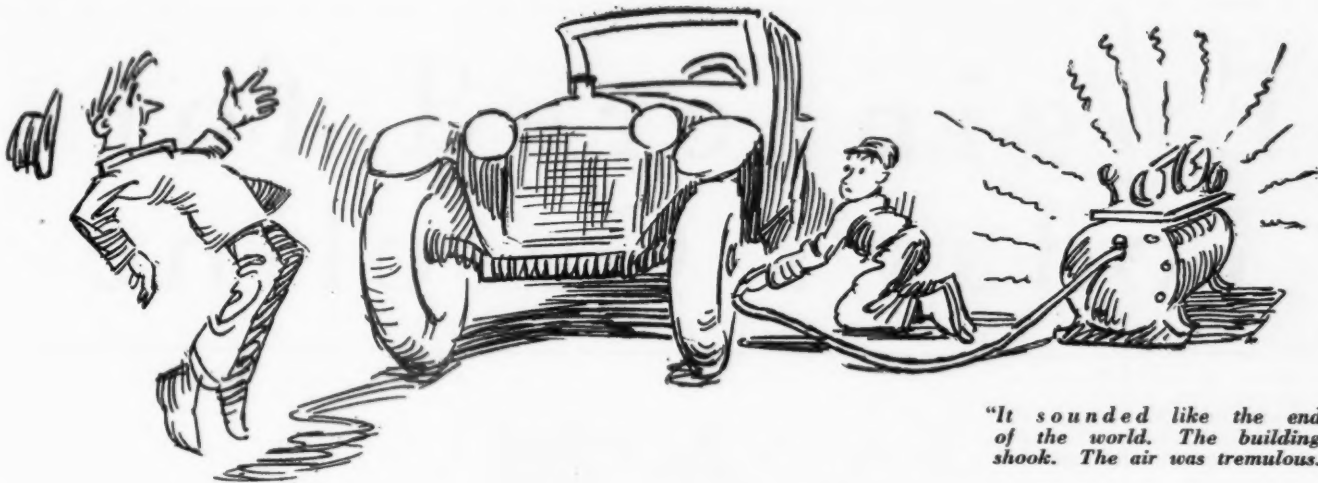
This is a tremendous factor of safety. The many dealers who have experienced the loss and worry of handling cars too hurriedly produced will be quick to appreciate such an asset.

Dealers who secure the Sterling-Knight franchise acquire an exceedingly profitable asset and are assured the support of a soundly financed, well managed factory.



STERLING-KNIGHT

THE STERLING-KNIGHT COMPANY • WARREN, OHIO



"It sounded like the end of the world. The building shook. The air was tremulous."

Noise and Inefficiency vs. Speed and Silence!

THERE are 3 ways to fill a tire swiftly:

- 1 To run a small compressor at high speed. (Harmful and Destructive.)
- 2 To use a Big Compressor. (Costly and Wasteful where a smaller one would do.)
- 3 To use a Brunner, which, because of its slight head clearance, delivers a full load at every stroke, and even at low speed fills a tire in record time.

If you're not familiar with the distinct difference between a Brunner-made compressor and the ordinary sort, it would pay you to write us for full information. We should be glad to suggest the best and most economical method for filling your exact requirements, and to demonstrate for you just what a Brunner will do, without placing you under the slightest obligation, or costing you a cent. Wouldn't it be better to KNOW about this than just to "guess" at it?

(CATALOGED)
in the Red Directory



*"Good for Twenty Years
at Hard Labor!"*

"WHAT'S that—an Earthquake?" asked a motorist of the garageman. "No," answered the garageman, "I just turned on the compressor." It sounded like the end of the world. The building shook, the air was tremulous with sound and vibration. But the tire filled very slowly.

Now, a Brunner's start is very quick—virtually instantaneous. And it runs with practically no noise or vibration at all.

But it fills the tire quickly—because its pistons almost touch their cylinder heads, there is no leakage or lost motion, and a full quantity of air is forced into the tire at every stroke of the compressor.

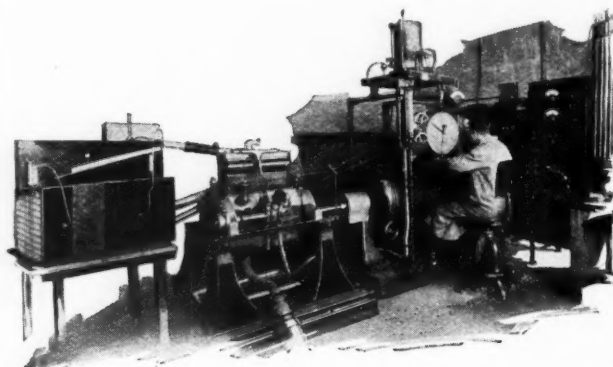
Speed is not only pleasing to the motorist. It is a profit to the dealer. Hasteless, wasteless speed saves time and money. It means more jobs finished, more profits made within the same number of hours.

You don't have to run a Brunner at high speed, and you don't have to buy an oversize Brunner—to get a quick job of tire filling. Even a small Brunner, at low speed, will deliver air faster, in greater volume than you've been accustomed to getting by other means.

BRUNNER MFG. CO., Utica, N. Y.

Oldest and Largest Manufacturers of Garage Air Compressors in the World
UTICA CINCINNATI KANSAS CITY SAN FRANCISCO

Engineered for Today's Gasoline



Tillotson Engineering Department making
dynamometer test of new Tillotson
non-air-valve carburetors.

Tillotson engineers have given the world a carburetor that gets the last ounce of power out of the last drop of today's gasoline.

In the hands of average drivers, in actual work-day service, the new Tillotson non-air-valve Carburetor enables those drivers to stop less often at the gasoline pump.

Older carburetor models will not give the gasoline economy of the new Tillotson. The replacement business is growing by leaps and bounds for this reason. Liberal discounts make it more profitable than the sale of other equipment and accessories.

We still have open territory for the right kind of state and local distributors. Apply with full particulars as to your capacity to take care of the Tillotson line.

TILLOTSON MANUFACTURING CO. • TOLEDO

Tillotson
CARBURETOR

BUILT BY DURANT

DURANT and STAR—there is not another selling combination with such wide appeal and sales opportunities in the industry. Built by Durant and backed by the Durant name.

We would like every automobile merchandiser who is interested, to have a copy of the DURANT SUCCESS ANNUAL. Sent free on request.

DURANT MOTORS, Inc.

General Sales Dept.

LONG ISLAND CITY, N. Y.



Perhaps You Can Get This Agency

R. I. V. Service Stations are springing up in all sections of the country. Uniformly, they are successful—the volume of business we receive from every one shows a constant monthly increase.

If your territory is open, and you can qualify, we should be glad to have you communicate with us. You will like our policy. We want to get all the business we are entitled to. We want our distributors to get the same—and make a profit on every bit of it.

We do *not* create distributors to compete with one another. The number we appoint in any given territory depends entirely upon the ease with which the territory can be worked, the size of the organizations doing the selling, and the nature and extent of their trade.

Some of the keenest merchandizing minds in this country have worked out the R. I. V. dis-

tribution plan, which gives a fair deal to every distributor, and an assured opportunity to make a he-man's profit upon a much-wanted ball-bearing service.

*We welcome applications for
distribution rights and assure
each applicant of thorough
and courteous consideration.*

1755 Broadway



New York City



Years of Research—Brought You the **ALL-IN-ONE** BATTERY TERMINAL OHIO VISE TYPE



To install, simply fasten ALL-IN-ONE terminal to cable in manner illustrated—then slip terminal over battery post and screw nut up tight.

To take terminal off battery post, simply loosen nut and tap on end of thread slightly. The terminal can then be lifted off.

Bronze heavily coated electrolytically with pure lead—long life and satisfaction assured.

Patent applied for.

—The ONE terminal that connects ANY and ALL types of batteries securely to all cables.

Over 20,000 All-In-One terminals now in use prove without a doubt that you should carry and stock only the Ohio All-In-One Terminal for all your customers.

You save space, increase your turnover and make more money.

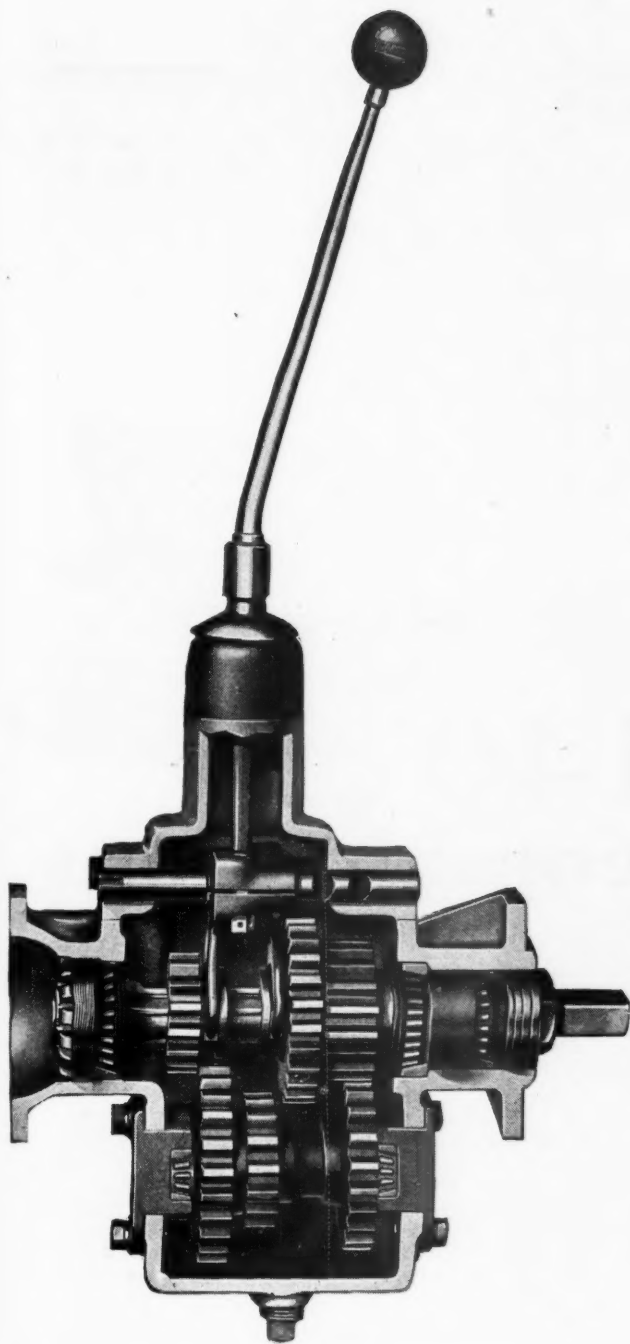
Order from your jobber—he stocks them

The Ohio Parts Co.

3307 Colerain Ave.,



Cincinnati, O.



What it makes the Ford truck DO per DOLLAR sells the Warford. It puts 2-ton hauling costs on the lowest Ford basis. The six forward speeds of a Warford-Ford include an UNDERDRIVE to pull 2 tons through absolutely anything. And Warford OVERDRIVE frisks the 2-ton Ford at a speed wagon pace where the going is good or when empty. No truck has a better transmission than Warford. Add the 2-ton market to your possibilities. Write us.

**The Warford Corporation
44 Whitehall Street, New York**

Warford

AUXILIARY TRANSMISSION

AUBURN, N. Y.
Foster-Warford Co.

BALTIMORE, Auto
Accessory Association
26 S. Greene St.

CANTON, Ohio
Dine-De Wees Company
400 Walnut Ave., S. E.

DALLAS
Houdaille-Polk Co.
2218 Commerce St.

DAVENPORT, Iowa
Sieg Company

DENVER, Motor
Specialties Company
17 W. 13th Avenue

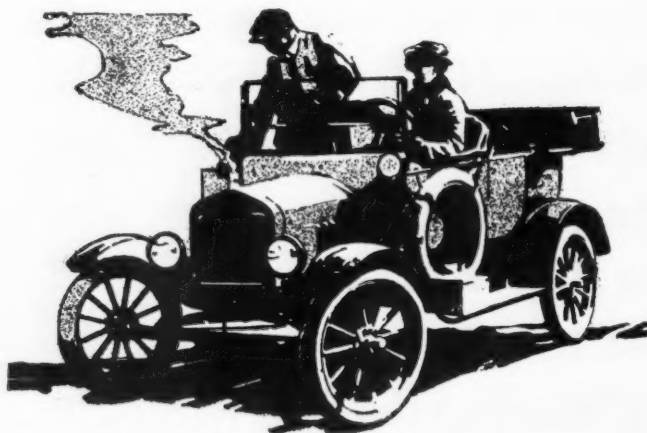
MEMPHIS
Continental Body Co.
476 Union Ave.

MINNEAPOLIS
McGee White Corporation
1311 Hennepin Ave.

NEW YORK
Motive Parts Corporation
796 10th Ave.

SAN FRANCISCO
Warford-Pacific Co.
1111 Post Street

STOCKBRIDGE, Mich.
Transmission Sales Co.
VANCOUVER, B. C.
E. W. Jay
WICHITA, Kans.
Price Auto Service Co.
301 S. Topeka Ave.



Prevents motor overheating

STEADY driving in the sweltering heat causes Fords often to overheat—fatigue. This condition is brought on by incomplete gas vaporization—an over-rich mixture.

An overheated motor and its attendant ills are always to be guarded against. The Krafve Mixer Intake Manifold will do the guarding—automatically.

Show the Krafve Manifold to your Ford customers. Explain how its flattened construction permits of freer circulation and more thorough mixture. No sluggishness—(no matter how poor the fuel)—no difficult starting—no slow pick-up—no gas and oil waste—no dangerous overheating.

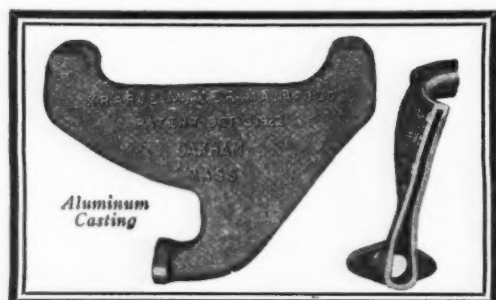
These are not claims merely! **TEST** a Krafve on your service car and you'll be sold on its merits.

Sells for \$5 with installation. Generous dealer profit.

Easily installed by bolting carburetor to Krafve with same bolts and nuts and clamping on cylinder in same position.

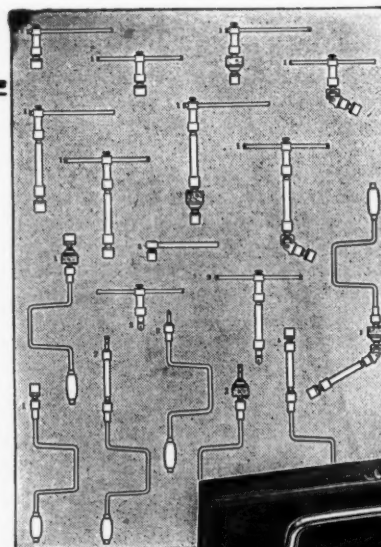
*Dealers, Jobbers: Write
for sales proposition*

Krafve Automotive Corp.
Oakham, Mass.



KRAFVE

Ford Mixer Intake Manifold



1—Ten of these
2—Two of these

H & G
Universal Set complete with Speed Wrench



140 combinations

all in this ONE set

Mechanic's Dream Comes True

THE H & G Universal Socket Set complete with Speed Wrench takes the place of a wheelbarrow full of single-purpose tools.

In this set you have everything you need in the way of a wrench. You take it with you from car to car. No time is wasted trying to find the proper wrench.

The application is rapid and natural. The nut to be loosened or tightened determines the socket to be used, which is done at a glance. Its location determines what attachments are required, and they are instantly snapped on and the job is done.

Easy, simple, quick, practical—the better way.

The Sockets, which are the heart of any set, are stronger, and permit the mechanic to use his strength. They are cold-drawn from bar stock by the Allen Process and are specially heat-treated. Just the right thickness to combine proper margin of safety in strength and still be thin enough to be used everywhere.

Superior in design, strength and workmanship, this set of wrenches will save your time and temper because it is a real tool for real mechanics.

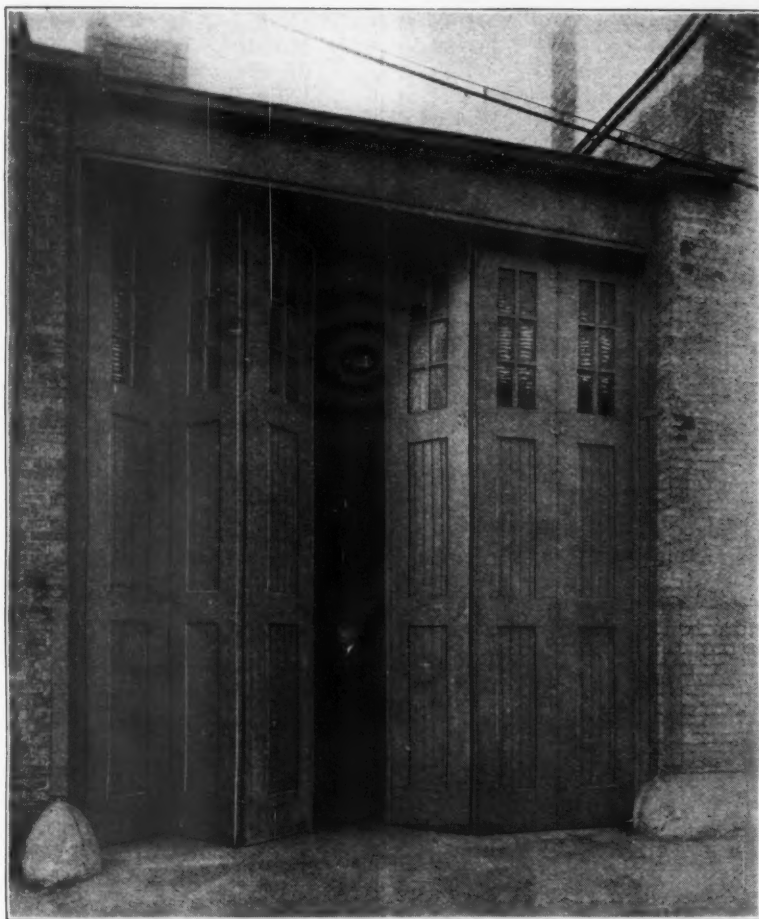
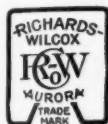
Ask your dealer. Write for literature.

The Eastern Machine Screw Corporation
10-20 Barclay St., New Haven, Conn.

Socket



Wrench



The Only Satisfactory Way to Hang Big Garage Doors

Garage doors of extra-large size are frequently necessary. While it is comparatively simple to construct big doors, it is a real problem to hang them satisfactorily and permanently.

Slidetite Garage Door Hardware has successfully solved this problem in numerous instances. A typical *Slidetite* installation of this kind is that at the J. A. Torstensen Company, Chicago, shown in the illustration above. The doors are 21 feet high to permit trucks loaded with large lights of plate glass to pass through.

These doors move smoothly and easily in spite of their great height and bulk.

Doors hung on *Slidetite* slide and fold completely out of the way, leaving an unobstructed opening up to 30 feet wide if necessary. Require no tinkering as they never sag or bind. Easy to open, even in a high wind, and cannot possibly slam shut. Close tight, snug and secure. Our Engineering Department is equipped through wide experience to assist you with suggestions and plans. Bring your garage door problems to us.

Slidetite
Garage Door Hardware

Before building another garage—or remodeling an old one—be sure to write for our free *Slidetite* book, X-29. Contains many practical suggestions and illustrations of modern garage doorways. *Slidetite* may be obtained through hardware and lumber dealers everywhere.

New York
Boston
Philadelphia
Cleveland
Indianapolis
St. Louis

Richards-Wilcox Mfg. Co.
"A Hanger for any Door that Slides."
AURORA, ILLINOIS, U.S.A.

RICHARDS-WILCOX CANADIAN CO. LTD.
Winnipeg LONDON, ONT. Montreal

Chicago
Minneapolis
Omaha
Kansas City
Los Angeles
San Francisco



Sell the Shock Absorbers That You Can Guarantee to Give Satisfaction

Isn't it about time that you were able to recommend Shock Absorbers with the full conviction that they are going to back up every word you say?

Wouldn't you like to tell your customer that you can put a set of shock absorbers on his car that will bring an ease of riding, a gliding smoothness of motion beyond anything he has ever before experienced?

Wouldn't it pay handsomely to have him tell his friends that his car now rides smoothly over the roughest roads—that he never knows what it is to have a spring kick back at the body, and that it was YOU that brought him all this long sought comfort?

That is what "Manzel" dealers are doing. They are installing on their customers' cars "Manzel" Hydraulic Shock Absorbers, that automatically proportion their action to the size and severity of the bump, easing the springs down so gently that the shock is never felt.

And because of their exclusive design, rugged construction and automatic oil control, they are not subject to the wear and derangement common to the ordinary type of rebound controller, but will continue to give efficient service indefinitely.

"Manzel" Shock Absorbers do give efficient service and are guaranteed to give satisfaction in every way.

May we send you full particulars?

Manzel Brothers Company
306 Babcock St. Buffalo, N. Y.

MANZEL

HYDRAULIC
SHOCK ABSORBERS

Satisfying Your Best Wrench Customer

Mossberg Wrenches and Tools for Fords make up the most complete and efficient assortment found in any line. There is a tool for every Ford job—result, no lost sales. Every tool meets a particular need of the Ford owner in a way that means complete satisfaction as regards construction, efficiency and price.

The following are leaders in the Ford line and should occupy a prominent part in every dealer's stock. They represent quick turnover and worthwhile profits.

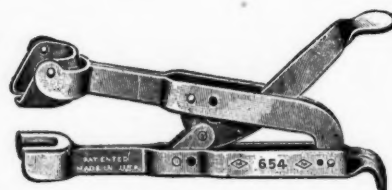
No. 654—NEW "PARALLEL" Valve Spring Lifter for Fords. (See illustration.) The swinging bucket on the lower lever allows the springs to rise in the proper plane without binding. The pins are then easily removed. Other desirable features.

No. 608—VALVE GRINDER Rocker points assure ease of operation and well ground valves. Fits all valve tops except under the dash (use Valve Grinder No. 607 for this operation). A popular seller.

No. 1944—SOCKET SET—2 wrenches with 8 socket openings and 77 possible adjustments on FORD cars. You never saw such value packed into 2 wrenches. Sells itself.

No. 622—MAIN BEARING BOLT WRENCH—Made to do one job—and do that well. A single piece of heavy forged steel. The round construction of socket is an exclusive Mossberg feature.

Write for complete catalog and information regarding the "All-Mossberg" dealer plan.



No. 654 "Parallel" Valve Spring Lifter for Fords

MOSSBERG

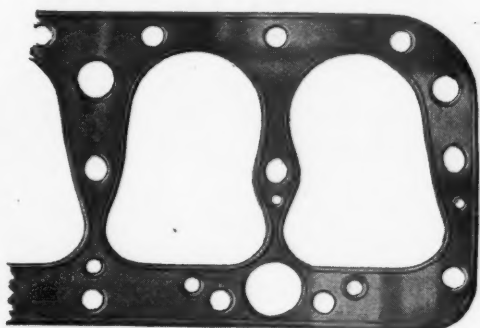
CHROME MANGANESE STEEL
WRENCHES and TOOLS



FRANK MOSSBERG CO.
Lamb Street
Attleboro, Mass., U. S. A.

BRANCH OFFICES
Chicago, Ill.—180 N. Market Street
Los Angeles, Cal.—5005 Cimarron Street
Dallas, Texas—1129 N. Beckley Avenue
Seattle, Wash.—214 Maritime Building
Montreal, Que.—Office 21 Mt. Royal Hotel

FOREIGN SALES OFFICE
461 8th Ave., New York City

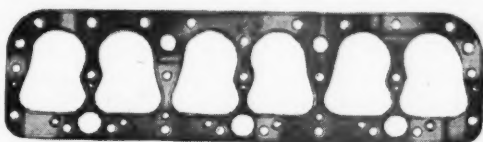


The take-up in this gasket—

is made possible by its construction.

Buckling is prevented. The bottom layer of copper is bound all the way around the edge by a mechanical process which assures uniform thickness. Every hole is bound around its edges. The strength of this gasket is increased more than 100% over the old type open edge gasket. NEVER-LEAK gaskets can't blow out. They retain their life. They last longer. They keep the customer sold.

That's where your profit comes in.



There is a NEVER-LEAK Gasket for every standard make of car, truck and tractor. A sample will be sent on request. NEVER-LEAK catalog gives detailed description of gaskets used on various cars, trucks and tractors. Send for it.

THE FITZGERALD MFG. CO.
Torrington, Conn.

NEVER-LEAK

Cylinder Head Gaskets



For difficult and seemingly impossible places, use

1000 SERIES TEE FLEX

TRADE MARK REG.

USE IT AS A TEE HANDLE
WRENCH OR TO GET
AROUND CORNERS—IT'S FLEXIBLE

Most every car has a few nuts that call for the removal of some other part before you can get at them—that is with the regular wrenches. But the Tee Flex is the champion contortionist and gets 'em all.

It is built to the usual Walden-Worcester standards and features a special universal joint that is strong and works smoothly, at a wide degree of angularity.

The Tee Flex is deserving of a special display—and when displayed will have a telling effect in stimulating sales.

WALDEN-WORCESTER
INCORPORATED
WORCESTER MASS.



Your wrist wasn't made with a ratchet



Some other "Yankee" Tools

Ratchet Chain Drills
Ratchet Breast Drills
Ratchet Hand Drills
Ratchet Bench Drills
Ratchet Tap Wrenches
Bench Vises, Removable base
Plain Screw-drivers
1½ in. to 30 in. blades

Dealers
everywhere
sell
"Yankee"
Tools

That's why "YANKEE" Ratchet Screw-drivers were made—to save your muscles from the strain of gripping and letting go the handle dozens of times in driving each screw. Save time, too.

Just grasp the handle and twist. Your first good grip need not be relaxed until screw is home. It's like winding your watch.

To draw screws, move ratchet shifter to back notch. A finger-touch does it.

"YANKEE" Ratchet Screw-drivers

No. 10—(Illustrated). Blades of best cast steel, specially tempered, ground, polished and tested. Blade lengths 2, 3, 4, 5, 6, 8, 10 and 12 inches.

No. 11—Same as No. 10 except that ratchet shifter moves across barrel.

No. 15—(Illustrated). Has handy knurled thumb turn for starting small, wobbly screws. Blade lengths 2, 3, 4, 5, 6 and 8 inches.

Write today for Free Tool Book

Illustrates and describes all the ingenious "Yankee" Tools for saving time and labor and doing otherwise impossible jobs.



NORTH BROS. MFG. CO., Philadelphia, U. S. A.

"YANKEE" TOOLS
Make Better mechanics



Increasing Your Sales of New Cars

Boost your sales through the recommendation of new owners. Give them greater riding comfort than ever expected—surprise them with elimination of all stiffness—all spring squeaks. Bubbling over with satisfaction and delight, they will tell their friends—enthuse them—sell them. A powerful sales stimulant, yet costs only a small effort on your part and you make a good profit on that effort.

Experienced motorists know that springs should remain dust, water and dirt proof—always constantly lubricated, to insure smooth, buoyant, gliding motoring comfort. A five minute demonstration will prove to them that Jeavons Spring Lubricators accomplish this and do it better than any other covers made. Lined throughout with a special woven wicking and built of water and oil proof black enameled duck of high tensile strength. Strength of material and not thickness—governs the efficiency of a spring lubricator. Unnecessary to remove spring clips when installing. Many car dealers make them standard equipment.

Orders filled the same day as received. Here is your opportunity to increase your local prestige as a dealer.

JEAVONS
SPRING LUBRICATOR

(Patented April 18, 1911-April 13, 1915)

2540 Prospect Ave., Cleveland, O.

Oh Boy! Does the Old Ford Chatter?



There is nothing more jarring on the nerves or harder on the car than chattering transmission bands. This chatter is caused by improper lubrication entirely and the remedy is a

FORD FAITHFUL OILING SYSTEM

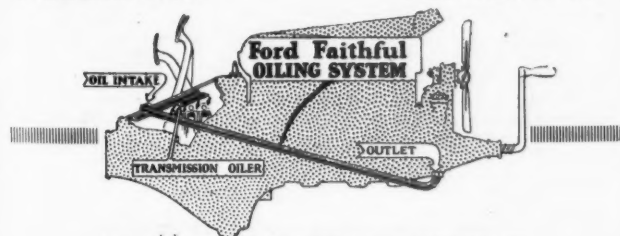
This system not only thoroughly lubricates the transmission, making the bands operate smoothly and last 50% longer, but strains every bit of oil going through the motor.

The "Ford Faithful" also positively assures perfect lubrication for the entire motor, thus preventing 90% of motor ills and increasing its life and efficiency 50%.

It will pay you as a Ford owner or Dealer to write for further particulars.

Price \$5.75 Complete
W.O. Thompson Mfg. Co.

330 Mountain View St.
Pasadena California



NO CONNECTION WITH FORD MOTOR CO.

What's Goodwill?

*A Franklin
Air and Water
Station
Builds it
for you*



GOODWILL is the thing that makes your business go—the thing that brings automobile owners to your garage when they need something. Your goodwill depends upon the service you give.

There is nothing better than to give your customers a quick, clean and convenient air and water service. You can do it with a Franklin Air and Water Station.

The Franklin outfit will inflate tires and fill radiators as easy as falling off a log. With the long air hose you can reach two cars at the curb without shifting their position—the head is revolving. The hose arm is counterbalanced, and when released drops slowly back into position without injury to the hose or arm. The Franklin is built to endure hard, continuous service. The Franklin is like the electric light or the telephone—after you've used it you'll wonder how you got along without it. Order yours from your jobber today, or write us.

\$58⁵⁰ f. o. b.
Norristown

Franklin
Air Compressor Works

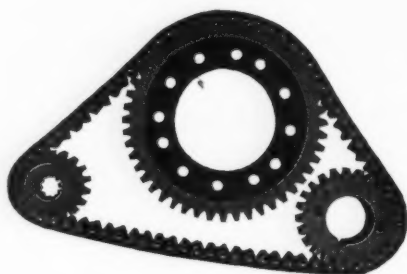
2604 Main Street
Norristown, Pennsylvania

Manufacturers of the Franklin Air Compressor

"WHITNEY"

LONG SERVICE **CHAINS** HIGH MILEAGE
SILENT TYPE

Never Skip the Sprocket Teeth



Unrivalled for Great Mileage

THE WHITNEY MFG. CO.
HARTFORD, CONN.

New York: L. C. Biglow & Co., Inc.
Boston: George C. Steil
Philadelphia: R. J. Howison
243 West 55th Street 200 Devonshire Street 624 Race St.
San Francisco, A. H. Coates Co., 770 Mission St.

Sells in All Seasons

The Higgin All-Metal Visor is the all-weather visor and fills a ready demand in all seasons. With a popular price and its adaptability to all cars including Fords, the turnover is quick and the profit big.

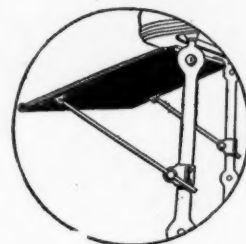
Sells for
\$3.50
and nets a
real profit.

The Higgin is as durable as it is good looking. Made of 22 gauge cold rolled steel and finished in hard baked enamel—black on the outside—green inside. The lower edge is turned up to form a gutter that drains water over the side of the car.

We protect your territory and give real merchandising assistance.

Write for details.

THE HIGGIN MFG. CO.
Automotive Division
Newport, Ky.



HIGGIN ALL-METAL VISOR

Installed in
twenty minutes. The
brackets are
easy of adjustment
and always stay
put without rattling.

GUARANTEED APEX INNERINGS (INSIDE PISTON RINGS)

NOW 20c
EACH RETAIL

Announcement of our price reduction is doubling up the demand for Genuine Apex Innerings. Dealers and jobbers check your stocks today and be set to get in on this business.

The Same Guarantee

backs our product. Made of the finest obtainable material; scientifically engineered; fully patented. When you sell or use Genuine Apex with our Guarantee Tag you have full protection.

Stop Oil Pumping—Piston Slap

fouled plugs; lost power. Renew pep, power, gas mileage and flexibility at low cost. For every type gas engine.

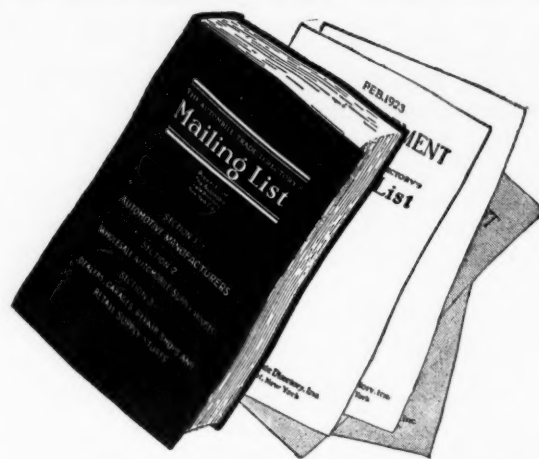
New Retail Price Only 20c Each

up to 3/8" wide or 5" diam. Larger 35c. Dealers: Order from your jobber or write us direct for facts. Jobbers: Write today for attractive new discounts.

Thomson-Friedlob Mfg. Co.
Peoria, Dept. C, Illinois



Fully Patented. Infringements Prosecuted.



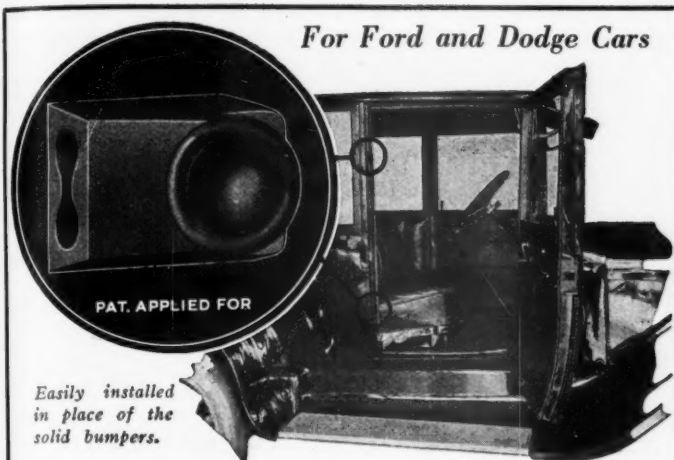
Every Sales Prospect in the Automotive Industry

The Mailing List of The Automobile Trade Directory is a complete roster of the individuals and concerns who buy and specify or authorize the purchase of practically everything that is used in the manufacture and maintenance of automotive vehicles.

The manufacturing, jobbing, retail and service fields are covered by the three sections into which this List is divided. For direct circularization, for planning the work of salesmen and for reference purposes this Mailing List is indispensable.

Send for specimen pages and details.

THE AUTOMOBILE TRADE DIRECTORY
239 West 39th St., New York



For Ford and Dodge Cars

No More Noisy Doors!

The vacuum cup of the Jorgensen Door Silencer absorbs the shocks of banging doors. These silencers grip the door and keep it closed snug so it can't rattle.

Moulded from tough but resilient black rubber.

Made especially for use on Ford Sedans and Coupes and on Dodge Sedans (all models) and Coupes (1922 or earlier). Special models for other cars will soon be available.

Dealers: Write for prices and complete information.

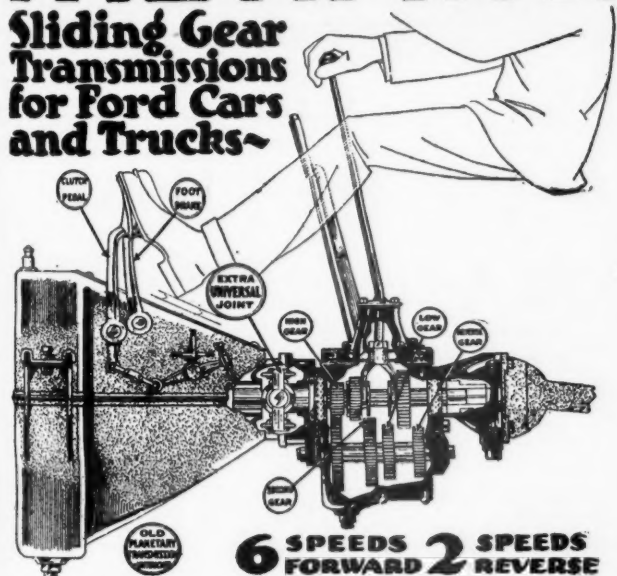
Jorgensen Specialty Co., Erie, Pa.

Jorgensen

DOOR SILENCERS

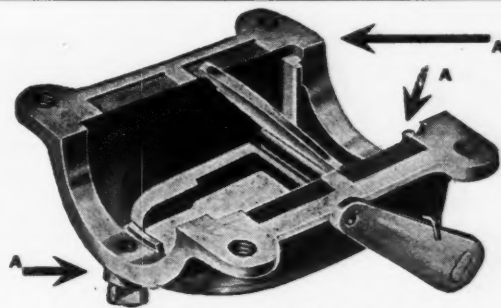
MOHAWK

Sliding Gear
Transmissions
for Ford Cars
and Trucks~



Converts the Ford car or truck into a standard machine with selective type gear shift, 3 Speeds Forward and One Reverse or 6 Speeds Forward and Two Reverse at driver's option. The MOHAWK can be installed with ordinary tools in six hours. It eliminates planetary troubles. Increases speed and power. It is **GUARANTEED FOR LIFE OF CAR OR TRUCK**. Write for full description and prices. **DEALERS:** Ask about territory still open.

The Mohawk Corporation. Dept. M, Rockford, Ill.



The shoulders (A) hold Testing Valve in place. It cannot work forward or backward, nor can it twist or turn. A big improvement.

Selling Big!

With the addition of the new G-Piel Split Motor Testing Valve to the already popular and approved line of G-Piel Muffler Cut-Outs—sales have taken a big jump.

The trade is now able to obtain all their Muffler Cut-Outs and Motor Testing Valves from one source of supply as the G-Piel complete line meets every requirement.

The New G-Piel Motor Testing Valve has all of the unique and distinctive characteristics of the universally known and widely used G-Piel Muffler Cut-Out together with exclusive features found in no other valve.

It offers the dealer greater sales opportunities and the complete line opens the way to greatly enlarged profits.

G-Piel Muffler Cut-Outs and the new G-Piel Split Motor Testing Valve at all good jobbers.

The G-Piel Co., Inc.,
Long Island City, New York

Sales Division

KORAX Inc., 56 West 45th Street
New York City



Split Type Outfit (Model-S) for Fords,
complete with chain, pulley and pedal ready
to install—\$3.00

G-Piel

Motor Testing Valve

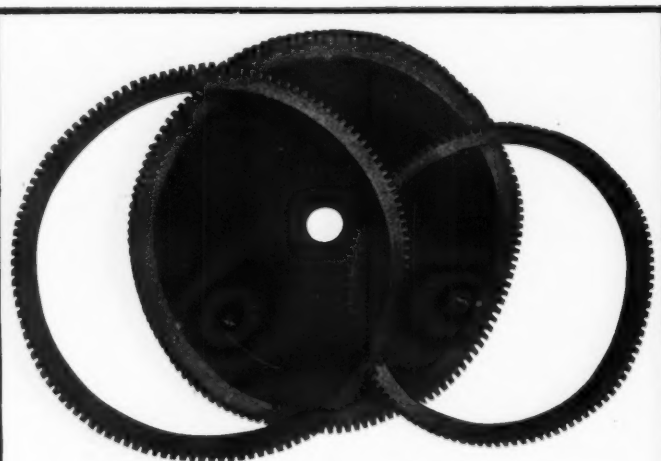
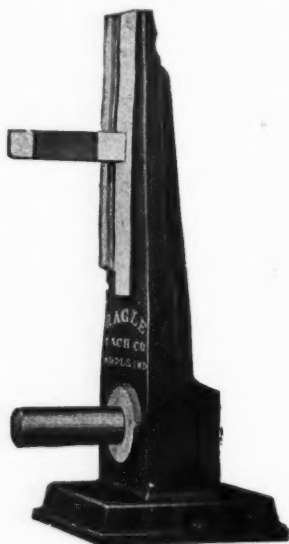


Helps you turn out quickly the kind of repair work that makes customers glad to boost your business—to send their friends to your place, where "work is done right."

With the **EAGLE Universal Aligning Fixture** you can easily and accurately prove pistons, wrist pins, bushings, pin holes and connecting rods. The **EAGLE** is complete with five bushings and a special vise clamp—there are no extra parts to buy.

Thousands of repair shops and service stations throughout the country have found greater speed and economy of production in the **EAGLE Aligning Fixture**. The **Eagle** costs no more than an inferior device, and soon pays for itself in the economy it effects. Ask your jobber about the **Eagle** or write us direct.

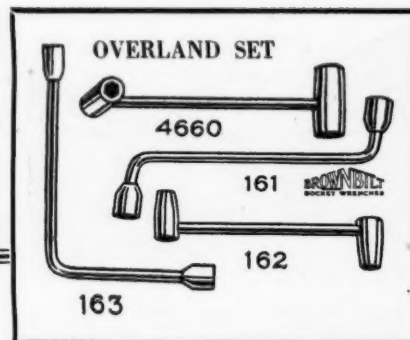
Eagle Machine Co.
24 N. Noble St.,
Indianapolis, Ind.



New Low Prices On Fly Wheel Rings

Increased quantity production has enabled us to get out a new and lower price list on Meachem Steel Gear Rings for Fly Wheels. Also our trade discounts have been increased to more than offset the lower list prices. Write us for the new list and discounts.

The Meachem Gear Corp'n.
Ring Dept. Syracuse, N. Y.



Service Set for Overland Car. Four wrenches in most needed sizes. List, \$3.85. A popular seller on accessory counter. Also sets for other cars. Write us.

Full wrench equipment saves time and labor

Service Shops profiting from good labor-saving devices are quick to see the value of full wrench equipment. There's a wrench best suited for every job and the well equipped shop has that wrench.

From the **Brownbilt Garage Assortment** of socket wrenches, the right wrench for the job is always available instantly.

Altogether, **Garage Assortment No. 400** contains 23 quality socket wrenches, covering all useful sizes and models. Lists at \$22. Details in our free catalog.

Brownbilt Wrenches are rust-proof and long-lasting. Ask your jobber.

THE BROWN CO., Syracuse, N. Y.

BROWNBILT
SOCKET WRENCHES



SAFETY Front Wheel Brakes

Can be attached to ANY MAKE of car. Wonderful overhaul opportunity as every motorist wants to be up-to-date. Operates from the regular brake-pedal. Permits any car to stop in less than **HALF THE DISTANCE** required with rear wheel brakes alone. Safety feature appeals to all—especially women-drivers. Absolutely no danger of skidding.

Don't pass this up. It is one of the biggest money-making opportunities you will have this year. Write us NOW about this. Big discounts.

GREEN
ENGINEERING COMPANY
DAYTON, OHIO

Big Profits Every Month

Selling the

CIRCLE S

Automatic Windshield Cleaner

List
Price
\$5.00

Every Motorist
Needs and Wants
An Automatic
Windshield Cleaner

Live dealers everywhere are making big profits every month selling the "Circle S." Simple, trouble proof, Non-failing mechanism is the big selling point. Its low price is the clincher that turns "suggestions to buy" into "Sales that pay." If you need profits investigate the "Circle S."

Something for the Car for Christmas

Write Us Today for Details & Discounts

F. W. STEWART MFG. CORP.

356 W. Huron Street

Chicago, Illinois

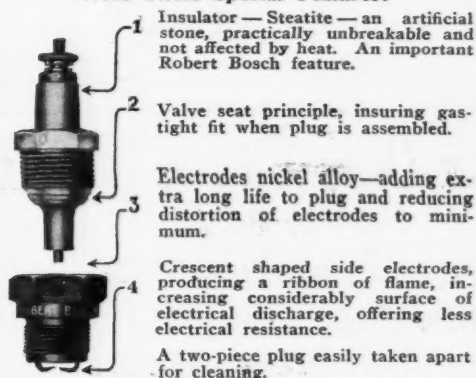
Manufacturers of the well known "Circle S" Speedometer Swivel Joints



Bosch

Robert Bosch Spark Plugs Outlast the Car

Note These Special Features:



1 Insulator—Steatite—an artificial stone, practically unbreakable and not affected by heat. An important Robert Bosch feature.

2 Valve seat principle, insuring gas-tight fit when plug is assembled.

3 Electrodes nickel alloy—adding extra long life to plug and reducing distortion of electrodes to minimum.

4 Crescent shaped side electrodes, producing a ribbon of flame, increasing considerably surface of electrical discharge, offering less electrical resistance.

A two-piece plug easily taken apart for cleaning.

Attractive territory open. Write us.

Robert Bosch Magneto Co., Inc.

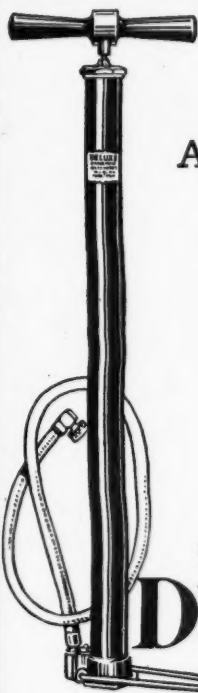
OTTO HEINS, President

123 West 64th Street

New York

Chicago Branch: 1302 South Wabash Ave.

The Genuine, Original Bosch Means Robert Bosch Only



A pump is only
as good as
its plunger

ORDER DIRECT
SPECIFYING
JOBBER

The
DeLuxe
TIRE PUMP

Also
ARVIN HEATERS
DE LUXE,
DE LUXE VENTILATORS

INDIANAPOLIS PUMP & TUBE CO.
INDIANAPOLIS



MELTON FENDER BRACE FOR FORDS

Holds the fenders firmly in place and stops rattles. Prevents fenders from sagging and cracking. Every Ford needs them. Fit both front and rear. Installed by anyone in ten minutes. Prices: nickel plated, \$2.75. Black enamel, \$1.75. Liberal discount to dealers.

Jobbers Wanted

MELTON FENDER BRACE CO.

Clovis,

305 North Pile

New Mexico



ANCHOR Automobile Lamps

You profit more by selling Anchor lamps. Seven years of close study and experience is in their design. The materials in them are the best the market affords. They give good, long service without complaints or make-goods. Our low manufacturing and selling costs allow you to make an extra margin of profit.

A sufficient stock of Anchor lamps requires small investment, and is cleaned out quickly by the constant demand. Jobbers and dealers both make money on the trouble-free Anchor line. Send for size and price lists with generous discounts.

ANCHOR ELECTRIC CO.
557 W. JACKSON BLVD. CHICAGO, ILL.



We offer the services of our Engineers in assisting Designers on layouts involving the use of Thrust Ball Bearings in any type of machine where Thrust Ball Bearings can be used. Our broad experience covers many years. We are ready to serve you at any time.

THE BEARINGS COMPANY OF AMERICA

LANCASTER, PENNA.

Western Sales Office,

1012 Ford Bldg., Detroit, Mich.



With Only City Gas as Fuel
No Forced Air Blast
The No. 101

JOHNSON Bench Furnace
Has Proven the Best

For

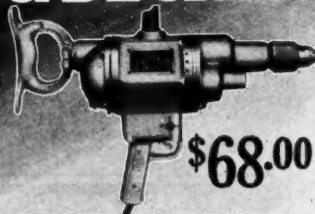
Any Bench Work Requiring Heat

JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

BLACK & DECKER

DRILL

*"With the Pistol Grip
and Trigger Switch"*



\$68.00

THE BLACK & DECKER MFG. CO.
TOWSON, MD.

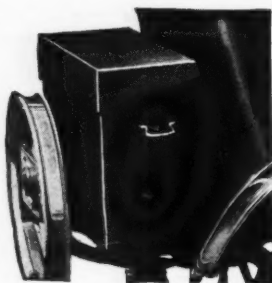
A Steel Trunk for Fords

Improves the appearance of the Ford and furnishes the owner with a dust and rain-proof trunk that can be locked. A special frame or trunk carrier furnished which can be installed without drilling any holes or special tools, merely fasten to body. Trunk 20 in. high, 34 in. long, 16 in. wide at bottom, 11 in. wide at top. List price complete \$18.00. West of Rockies \$20.00.

Manufactured by
The Fremont Metal Body Co.
Fremont, Ohio

For Open or Closed Cars

"ALL PURPOSE" Ford Car TRUNK



**Dealers and Distributors Wanted
TO SELL**

WOLLO SPARK PLUGS

Pack them full of oil or grease, they'll fire. Keep down carbon—save gasoline.

Write Us Today for Selling Proposition



Fires longer in that oil pumping cylinder.

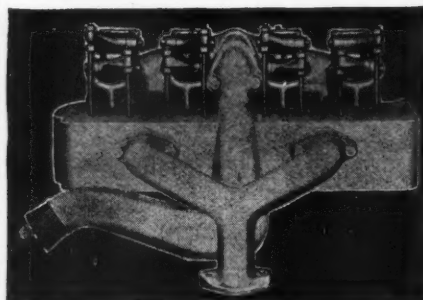


WOLLO

3328 Olive St.

St. Louis, Mo.

ROOF 16 OVERHEAD VALVE EQUIPMENT For Ford and Dodge Motors ROOF 8 VALVE HEAD FOR FORD MOTOR



Stupendous Power—
Lightning Speed

Ford racing cars with Roof Equipment are rivals on mile and one half mile tracks of the highest priced racing cars. Doubles the pulling power of the Ford or Dodge pleasure car or truck. Hill climbing and general road work beyond wildest dreams of the owner. Complete—ready for installation—no machine work necessary. We are headquarters for all speed equipment. No matter what you want, write us. Racing quality—lowest prices. A postal card brings you complete list of our specialties.

Jobbers—Dealers—Consumers—Write Us
THE LAUREL MOTORS CORPORATION, ANDERSON, INDIANA

There's a GILLIAM Bearing for practically every application and every location in every make of automotive equipment.

Cups Cones Rollers
Alloy Steel Throughout

GILLIAM
TAPERED ROLLER
Bearings

THE GILLIAM MFG. CO.

Canton, Ohio

INTERLOCK CRANKSHAFT BALANCE



for
Fords
and other
4-cyl. Cars.

\$10 and one hour's time makes a FORD Car or Truck (or \$11 for other 4-cylinder motors) as vibrationless as many a good SIX. Puts crankshafts in DYNAMIC BALANCE. Crawl along in "high" without bucking. Eliminates periods of vibration. Makes motors smooth at ALL speeds. Saves wear on bearings. Counter-weights INTERLOCK—no strain on holding bolts. Impossible for them to loosen. Take off crankcase cover and apply with a wrench. Not an experiment. Big success wherever used.

AT THE PRICE, EVERY MOTORIST WANTS THEM INSTALLED. Big opportunity for dealers. Write for details.

Manufactured by

THE READING SALES CORP.

300 Hollenbach Street

Reading, Penna.

Save Time!

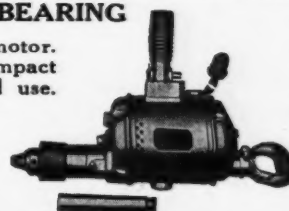
You can save time on dozens of jobs each day with a "Cincinnati" portable electric drill. A profitable investment—a tool your workmen will be glad to use.

The Cincinnati

½-in. "SPECIAL" PORTABLE ELECTRIC HAND DRILL
BALL BEARING

Light weight. Universal motor.
A powerful, durable, compact
drill for general all-around use.

\$65



COMBINATION BENCH DRILLING STAND FOR USE
WITH THIS DRILL, \$24

DRILLS

A complete line of portable electric drills from ¼ in. to 1 ¼ in. capacity.

GRINDERS

Bench—Floor—Tool Post—Aerial.

TIRE ROUGHING AND FINISHING LATHES

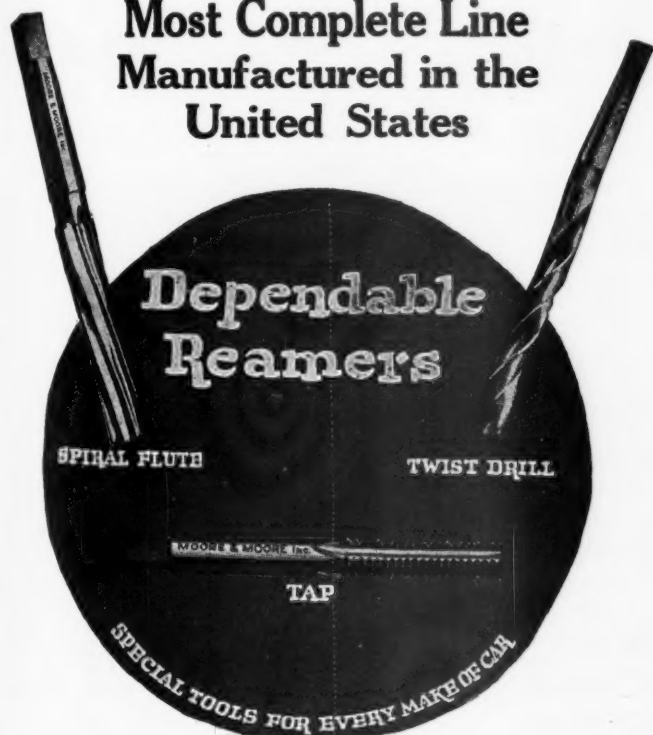
Send for Catalog

THE CINCINNATI ELECTRICAL TOOL CO.
1515 Freeman Ave., Cincinnati, Ohio

New York 50 Church St. Seattle 1115 Federal Ave. San Francisco 918 Hearst Bldg.

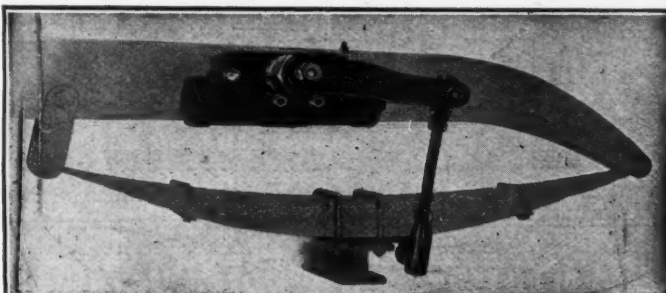
Philadelphia 1220 Real Estate Trust Bldg. Los Angeles 510 Equitable Bldg.

Most Complete Line
Manufactured in the
United States



Moore & Moore, Inc.

Reading, Pa.



**2WAY
HYDRAULIC
SHOCK
ABSORBERS**

(formerly called the Hydraulic Spring Control)

That our fundamental idea of controlling the springs—not to prevent their action—was correct, is shown by the success of our product.

A double-headed piston, its action governed by the pressure of oil, allows full spring flexibility, yet prevents violent road shocks. The more severe the shock, the greater oil pressure to minimize the action on the car body.

More Than a Shock Absorber

Easy to install, long life (all working parts in oil), and unusual record of service, make the 2-Way Shock Absorber an exceptional proposition for live dealers.

Full details upon request.

AUTO SPRING CONTROL CO.

Jamestown, New York

HYDRAULIC STEEL BUILDINGS
SECTIONAL STANDARDIZED



CORRUGATED BAR COMPANY, INC.
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**Every Tungsten Spark Plug Sealed
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"Always On The Job"

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Kokomo Long Life tires and tubes make money for dealers who handle them.

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KOKOMO RUBBER CO., Kokomo, Indiana
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SIoux
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Garage Tools
make well equipped shops. Ask your jobber.

Fast and ACCURATE for re-facing, reseating and grinding all size valves.

Sioux Flexible Shaft and Attachments take the tool to the work.

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Phillips "KEEP-KOOL" Ventilator

Reduces discomforts of hot-weather driving. Distributors wanted. Write for territory now.

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HOYT Electrical Testing Instruments

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OVER 50 WONDERFUL SHORT CUTS
IN NEW CATALOG T-105
ASK FOR IT.

STEVEN'S & COMPANY
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A quality group of fast selling items for every automotive requirement.
Organized to supply the jobber and dealer exclusively

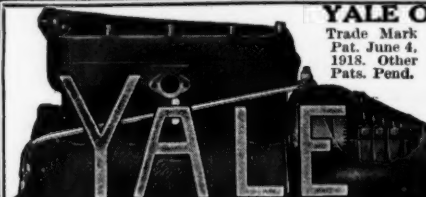
THE CINCINNATI VICTOR CO.
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Owners, by purchase, of the Jobbers' Division of the Corcoran-Victor Co.

YALE OILING SYSTEM
FOR FORDS

Trade Mark Pat. June 4, 1918. Other Pats. Pend.

Jobbers cash in now on strong advertising and sales campaign. Over 1,000 Ford dealers sell it. Write for discounts.

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When It Rains— There is big business for the wise dealer who carries a select stock of

ADCO WINDSHIELD WIPERS

Clear Vision Adco Kleanall Clearsite
A Type and Price for Every Customer

Write for descriptive literature on 76 Adco Products, giving your jobber's name


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"BULL DOG" Foot Accelerator for Fords

No stock of Ford Accessories complete without this popular item.

Manufactured by
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"UNICO" QUICK-SEATING "UNIC-OIL"
Plain Step Cut Oil-Control

PISTON RINGS

Ask for Samples and Prices

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Assure perfect fitting piston pins. Ream for regular and oversize work.

Will Not Chatter!

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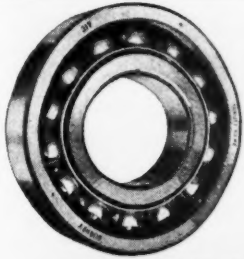


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GURNEY

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In selecting the right bumper for your trade, the first requisite is reliability. Your selection is made easy by the reputation for superior protection which New Era Bumpers have enjoyed for years—a reputation that has enforced the building of a new addition to our plant—the fourth in four years.

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SMALLEY DANIELS, President

70 Cottage Grove Ave. Grand Rapids, Mich.
Export Department, 130 W. 42nd St., New York City

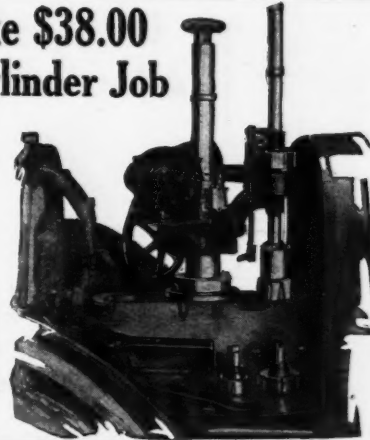
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Using a Stormizing Machine. This profit is NET, above all labor, cost of new pistons, rings, overhead, everything. Ask us to send you our book on Stormizing Machines. Made in all sizes for all shop needs.

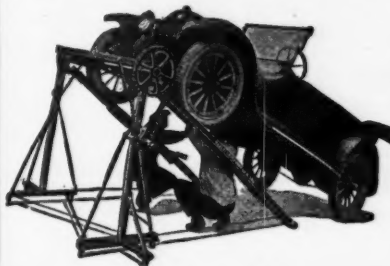
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We carry at all times a complete stock of every kind of cable used for automotive work. Many years of specialization have brought PARANITE Cables to the highest state of perfection. The finest grades of rubber compound, cotton and flexible enamel varnish are used.

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Quality jobbers handle quality cable—that's PARANITE.

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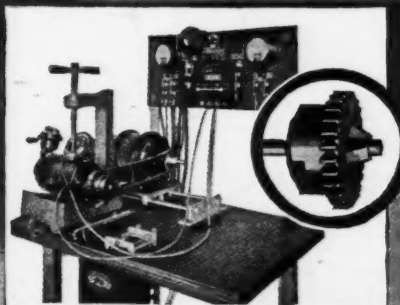


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INCREASE YOUR PROFITS!

Starting, lighting and ignition pays bigger profits than any other branch of automotive service.

The Excelsior Test Bench

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Payable \$50 per month

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A Better Motor

The development of this new Waukesha Bus and Truck Motor is a long stride in "heavy motor" efficiency. Its low operating costs builds bigger profits.

Write for details.

The Waukesha Motor Company
Waukesha, Wisconsin

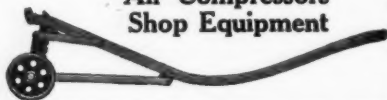
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A fine quality line of Quicklift and Turntable Jacks. Air Compressors and time saving equipment for the repair shop.

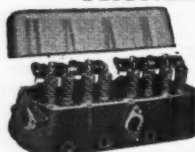
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DICKERSON

Garage Jacks
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Shop Equipment



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Standard equipment on 114
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Pass I. E. S. rules and all
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Makes it possible to fit over-size pistons without removing engine from the car when the variations do not exceed 5/1000 of an inch. Cylinders slightly tapered, out of round, or with shoulders worn by pistons or rings may be made round, straight and true. Price \$25. 12 ounce can Red Devil Compound, \$1.50. Write for complete details.

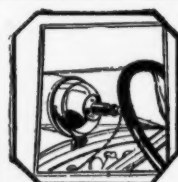
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Nine body types,
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Sells Wherever Shown

INSHIELD SPOTLIGHT

Fits snugly against windshield. No glass to cut. Easily and quickly attached. Can be pointed to any angle. Beautifully finished. Easy to sell. Jobbers, dealers, write for details.

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FLOAT THE CAR ON AIR

Promotes smooth, joltless riding by cushioning all road shocks. Positive two-piston action against air pressure and oil. Easily installed and permanent in operation. Big profits for live dealers and distributors.

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each size of car at
interesting prices.

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MOST ANY
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The Spencer Lock Tilting Steering Wheel first adds comfort in the driver's seat—then protects the car from theft.

And the insurance it saves pays back the purchase price.

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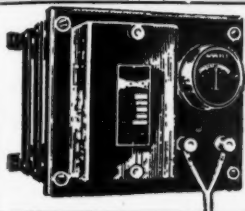
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THE NEW EMPIRE
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enables dealers to make extra profits on
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Automobile and Radio batteries charged for a nickel. Ten million car owners and five million radio fans are prospects for

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Can be operated without removing engine from vehicles. An absolutely true hole. Small first cost. Large profits. Have efficiency of large, expensive grinders.



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INTERNATIONAL MOTOR TRUCKS *for low-cost hauling*

Models range from the 2,000-lb. Speed Truck to the 10,000-lb. truck. Some territory is still open for dealers.

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When you find Ames dial gauges in the finest automotive shops, on close limit work — there's a reason. Let us tell you why. Write TODAY.

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"Universal" Type

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—WITHOUT PULLING THE MOTOR



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The Price and
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Complete Catalog on Request

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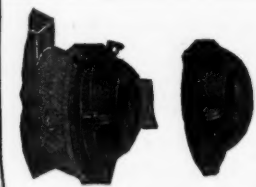


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Automatic
WINDSHIELD CLEANER

Pat. "It Cleans While You Drive"

A good profit for you in this wonderful, fast-selling necessity. Ask your jobber or write.

THE FOLBERTH AUTO SPECIALTY CO., CLEVELAND



The LINLEY
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Universal Joint Ball Cover for Fords

Eliminates that noisy rattling, bumping and backlash in the rear axle. Saves universal joint, because it keeps the grease inside, where it belongs.

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SILENT TIMING GEARS

Insure perfect timing

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STOP THAT GREASE LEAK
KEEP THE BRAKE BANDS CLEAN




Every Ford and 490 Chevrolet should install the R. & R. Automatic Grease Retainer, the only Grease Retainer with automatic take-up. Easily installed and requires No Special Tools.

PRICED—\$1.00 per wheel—\$2.00 Per Set

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Radiator Cores for Replacement
Can now be had

Of the Same Genuine Fedders Quality which has made Fedders Radiators standard equipment on America's finest cars.

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THREE PRODUCTS YOU NEED

ZIP FRICTION PASTE, for fitting in bearings.
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Water Mixed. THE ZIP ABRASIVE COMPANY Cleveland, O.
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IT'S EASY TO SELL

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"Sav-Oil" is stamped on bottom of every ring

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Pilot may be expanded to fit the valve-stem hole regardless of wear.
Cuts valve seat CONCENTRIC with hole. No chatter-marks. Full set in oak case \$15.00. Circular.

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THE DOUBLE CONTACT TIMER

Combines the "wipe" and "roll" contact principles. Gives full, perfectly synchronized spark at all speeds. Contacts are positive

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Write our Sales Department for full details.



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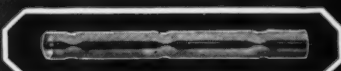
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More Power Less Fuel

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REQUIRES ONLY HEAT

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Over 500 Service Stations in 500 Centers

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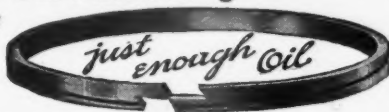
WICACO Twin Cut Piston Ring—

With the Wandering
Oil Groove

[pronounced
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New. Send for free booklet, today.

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Silent Timing GEARS

SILENT
DURABLE
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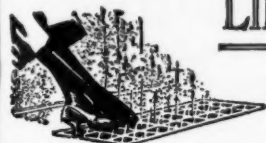
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Attractive in appearance, with cleaning
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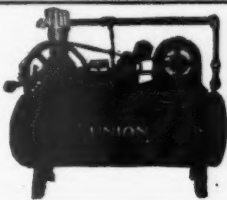
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ONE HALF THE LABOR LIST
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Built For Long Life

In filling tires be sure to get the
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Air Compressor of 2 cylinders.
Capacity 5 cu. ft. per minute.

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Taps, Dies, Cutters, Drills, Reamers
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JACOBS CHUCKS ARE STANDARD
EQUIPMENT ON THE BEST PORTA-
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Write for circular, "A Jacobs Chuck for
Every Purpose."

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Piston Pins TRINDL and Valves

Oversizes

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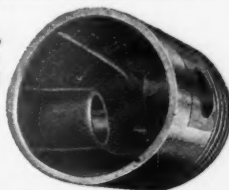
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closest dimensions and unexcelled workmanship. Send for specifi-
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A SERVICE STOCK of FOSTER PISTONS

Makes the Sales

You can get them for over 500 makes
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"EVERLASTING PERFORMANCE"

Engine Sealed and Guaranteed for 2 Years

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ANY CAR


ANY MODEL

ANY YEAR



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The
Self Locking Radiator Cap



OWN A MONEY MAKING BUSINESS
Make \$1500 to \$3000 Yearly Charging Batteries

Get in this big money-making business NOW! Small cash payment BRINGS YOU AN HB CONSTANT POTENTIAL OUTFIT TO GIVE 8-Hour BATTERY CHARGING SERVICE. Long easy terms on balance, more than carried by your increased profits. HB 8-hour charging service brings trade, beats competition. Long free trial on money-back guarantee. Write for information.

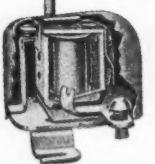
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TIMING GEARS

A General Electric product. Made entirely of cotton fabric processed to wear like iron. Eliminates all noise from the timing gear assembly. For practically all cars. Write for prices.

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Saves your battery—protects your lights—prevents your generator from being damaged by over-heating. Guards charging line, cutout and ammeter. The price is right—so it sells on sight. A winner among dealers and car owners. You'll be pleased with our proposition.

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Dayton, Ohio

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Luggage Carriers, Shock Absorbers, Fender Brace and Bumper for Fords, Little Giant Rim Tool.

Ask Your Jobber MARQUETTE MFG. CO. St. Paul, Minn.




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Quickly installed on Fords

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PISTONS
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Parts and Repairs
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AN UNUSUAL OPPORTUNITY is offered to purchase a series of one story buildings with tools and machinery and full line of auto material and parts, including wheels, springs, axles, carburetors, motors, etc. Buildings appraised at \$57,000; machinery and tools \$32,000; material \$201,000. Can be bought at great bargain. Fine opportunity for experienced manufacturer to establish auto plant or plant for manufacturing bodies. Situated in middle Atlantic States. Fine distributing point on three trunk line railways and plant immediately on main line with spur track. Your inquiry and investigation invited.

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A large manufacturing organization desires to take on and market several new automotive products, in which forged and stamped parts predominate. Give brief information regarding patent protection, state of development, market prospects, etc., outlining the merit of your proposition.

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Redden Truck Maker (consisting of frame and whole new rear) including wheels, tires and bearings, converts any Ford Car into a two-ton truck. A limited number at special bargain. Price \$100 each. Write or wire!

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MOTOR LIST COMPANY

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All Phones:
West 4918

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EXPERT CYLINDER AND CRANKSHAFT RE-GRINDING

SPECIAL LIGHT WEIGHT
CAST IRON PISTONS

PISTONS—RINGS—WRIST PINS
SCORED CYLINDERS REPAIRED

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You need only the name of the car—

FOR A SELECTED KIT
EVERY CAR



The Greatest Service
From
The Fewest Tools

to quickly select and sell a kit of Snap-on Interchangeable Socket Wrenches to the customer who knows and wants good tools. All popular cars are listed in "What Car Do You Drive?" with the right Snap-on equipment for each in handy form. Write for more details today.

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Snap-on

INTERCHANGEABLE
Socket Wrenches

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Two Propositions with Real Punch One for Jobbers, Another for Dealers

Renol and its companion specialties are being sold by a novel method which is bound to interest you. It has many distinctive features, but the best of them is that it works—not sometimes but every time.

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Gasket Cement
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Cleaning Fluid
Metal Polish
Neatsfoot Oil
Rapid Tar Remover
Rapid Repair and Engine Enamel

S. S. Stafford, Inc., 607 Washington St., N. Y.

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Child or Stepchild? An Analogy

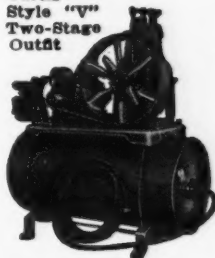
Maximum pressure—tank storage capacity—motor characteristics—automatic starting duty—frequency of operation—these are but a few of the problems peculiar to air compressors for free air service in garages and filling stations. It is to the purchaser's own greatest interest and protection to see that his CURTIS compressor outfit is a genuine CURTIS factory built product, factory guaranteed, supplied and sponsored by a designing, engineering and manufacturing institution with a career of 69 successful years.

When you purchase a CURTIS garage compressor outfit, built complete by the CURTIS organization in the CURTIS plant, your protection lies in the following facts:—

- 1—The proper relation and suitability of component parts. No misfit motors, switches and the like. Speeds, loads and capacities are right, starting loads are eliminated and there is a consequent freedom from trouble and expense which the chances favor in an amateur assembled outfit—a "stepchild" at best.
- 2—A complete unit tested as a unit under its own power in addition to the usual separate test of component parts; a final check-up under your actual running conditions duplicated in our shop.
- 3—The CURTIS guarantee covers the entire unit as a whole and the CURTIS organization stands back of it as a unit; no divided responsibility, no shifting of the blame for possible trouble later on,—“no passing of the buck.”

A Two-Stage Compressor Is Only as Good as its Intercooler

Curtis
Style "V"
Two-Stage
Outfit



- (a) COPPER Intercoolers with thin radiating fins rigidly attached are original with CURTIS two-stage compressors. One hundred and thirty-five per cent better heat-conducting properties than cast iron, 112% better than steel and 27% better than aluminum.
 - (b) CURTIS Intercoolers are approximately 50% longer and have about 100% more heat-radiating fins than competing designs.
 - (c) CURTIS Intercoolers are exposed their entire length to the cool blast of the fan flywheel.
- All the features of the CURTIS Single-Stage, plus real two-stage efficiency



Style "X"
Single-Stage
Outfit
Portable,
Belted or
Geared. Five
sizes, A.C.
or D.C. Motor.



Style "S"
Single-Stage
Outfit Belted
only. Five
sizes, 1/2 to 3
H.P.

We manufacture a complete line of both single and two-stage air compressors. A style, size and arrangement to meet your particular need. Write at once for full details and prices.

CURTIS PNEUMATIC MACHINERY CO.

1527 Kienlen Avenue St. Louis, Mo., U. S. A.
Branch Office 530-H Hudson Terminal, New York City.
Canadian Representative: Joseph St. Mars, Winnipeg and Toronto, Canada.

Curtis Pneumatic Machinery Co.

1527 Kienlen Ave., St. Louis, Mo.

Gentlemen:—Please send me descriptive folder and full particulars on Curtis Air Compressors.

Name _____
Address _____
Jobber's Name _____
Address _____



Our 8 Sales Branches
Carry Complete Stocks.
Address Automotive Gear
Co. as follows:

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BOSTON 1024 Commonwealth Ave.

CHICAGO 1425 S. Michigan Ave.

CLEVELAND 6305 Euclid Ave.

LOS ANGELES 1213 S. Hope St.

PHILADELPHIA 1404 W. Girard Ave.

SEATTLE 520 E. Pike St.

RICHMOND, INDIANA
Factory.

When you have a gear replacement job in the shop the quicker you return the car to your customer the better the impression you give of your service. Car owners don't like to wait—and they'll take their business where they get quick service.

Take advantage of Double Diamond "Nationalized Gear Service" which means that many jobbers in all parts of the country as well as our eight sales branches carry complete stocks of transmission and differential gears for practically all cars. Orders are shipped the same day received.

With every Double Diamond Gear goes a strict guarantee covering material, workmanship, interchangeability and satisfactory service.

Order from the nearest point or write for complete price lists, and the name of the jobber in your territory.

AUTOMOTIVE GEAR WORKS, Inc.

Factory and General Offices, 8th and South O Sts.,
Richmond, Ind.

Double Diamond Gears

"Every Double Diamond Gear Is a Nickel Steel Gear"



This New Switch Requires Only Two Minutes and a Drill

The new C-H *One-Hole* is the easiest of all automobile switches to install. Only a single 7-16" hole is required—drilled or punched in the dash in less than a minute. There are no screws to align—no plate to square with the other instruments. Convenient, large binding screws with cupped washers facilitate easy wiring.

Back of the panel, enclosed in the dustproof body, is a *real* switch mechanism, the famous C-H knife-blade contact type that is not affected by vibration, holding lights flickerless on the roughest roads.

Suggest this new switch for the control of all motoring conveniences—spotlights, parking lights, motometer lights, courtesy lights, step lanterns, dome lights, tonneau lights, cowl lights—dozens of places for you to profit. Your minimum labor charge for the few minutes' work in addition to the profit on the sale makes your time worth dollars. Order a handy carton of twenty from your jobber today. If he has not yet been stocked, write direct and we will see that you are supplied.

THE CUTLER-HAMMER MFG. CO.

Switch and Specialty Department

Works: MILWAUKEE and NEW YORK

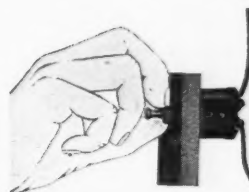
Easiest to Install



Drill or punch one 7-16 inch hole in the dash at point where the switch is desired.



Adjust set-rings to thickness of dash and insert switch stem.



Turn home the knurled locking collar and the switch is installed. Note mechanism is completely enclosed. Full sized binding screws with cupped washers make wiring easy.



One Hole

AUTOMOBILE SWITCH

The *prevailing* Steel Wheels



Motor Wheel eminence in steel wheels shows what part we played in nurturing them from novelty to an influential phase of car development.

The clearly prevailing steel wheels today, Tuarc, Disteel and Forsyth, are all Motor Wheel Products. Their strength, convenience and beauty emphasize the schooling Motor Wheel has had in producing all types of wheels, from the advent of the industry.

As the sales-importance of wheels increases, Motor Wheel Products, significantly, are more widely used. Motor Wheel supplies wheels to more car makers than any other wheel manufacturer.

MOTOR WHEEL CORPORATION  LANSING, MICHIGAN
Wood Wheels Steel Wheels Stampings

Tuarc • Disteel • Forsyth